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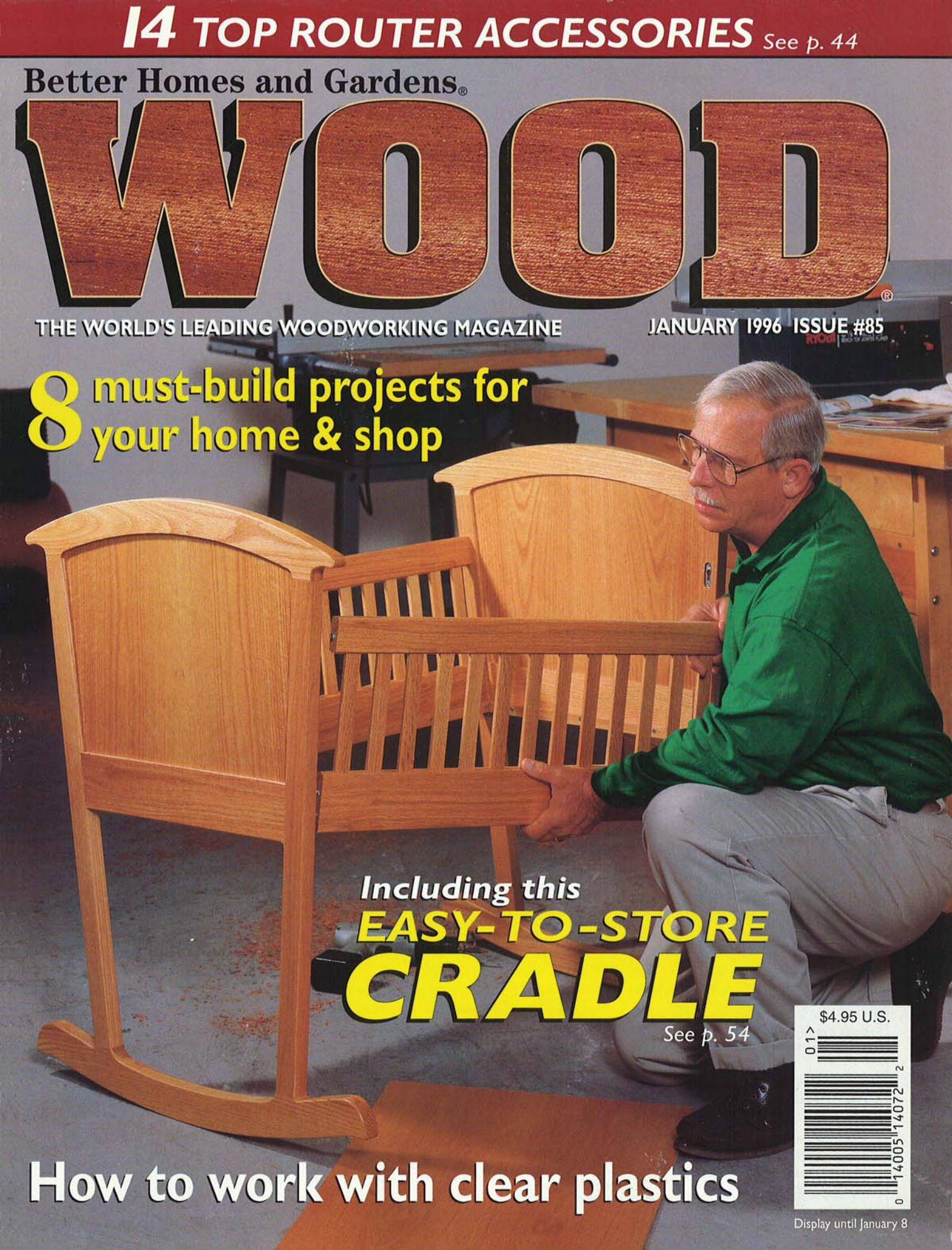
Better Homes and Gardens®

WOOD®

THE WORLD'S LEADING WOODWORKING MAGAZINE

JANUARY 1996 ISSUE #85

8 must-build projects for your home & shop



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EASY-TO-STORE CRADLE

See p. 54

How to work with clear plastics

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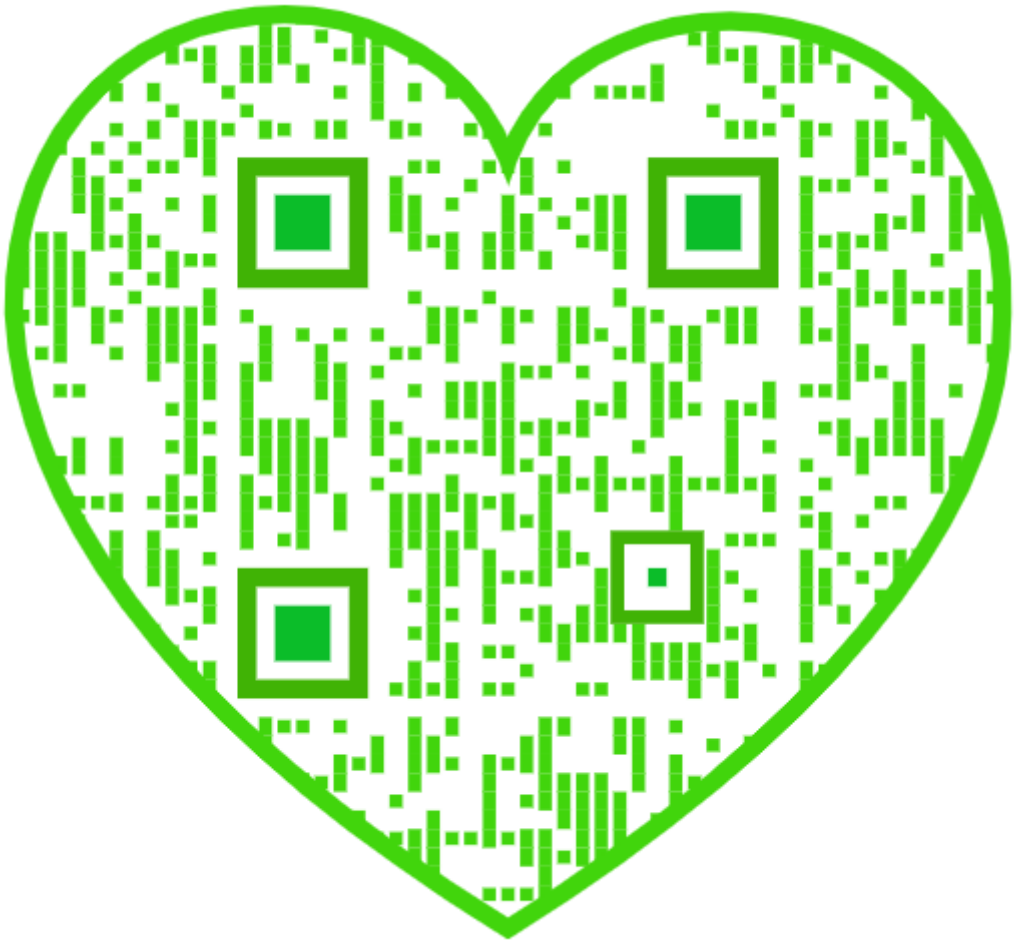

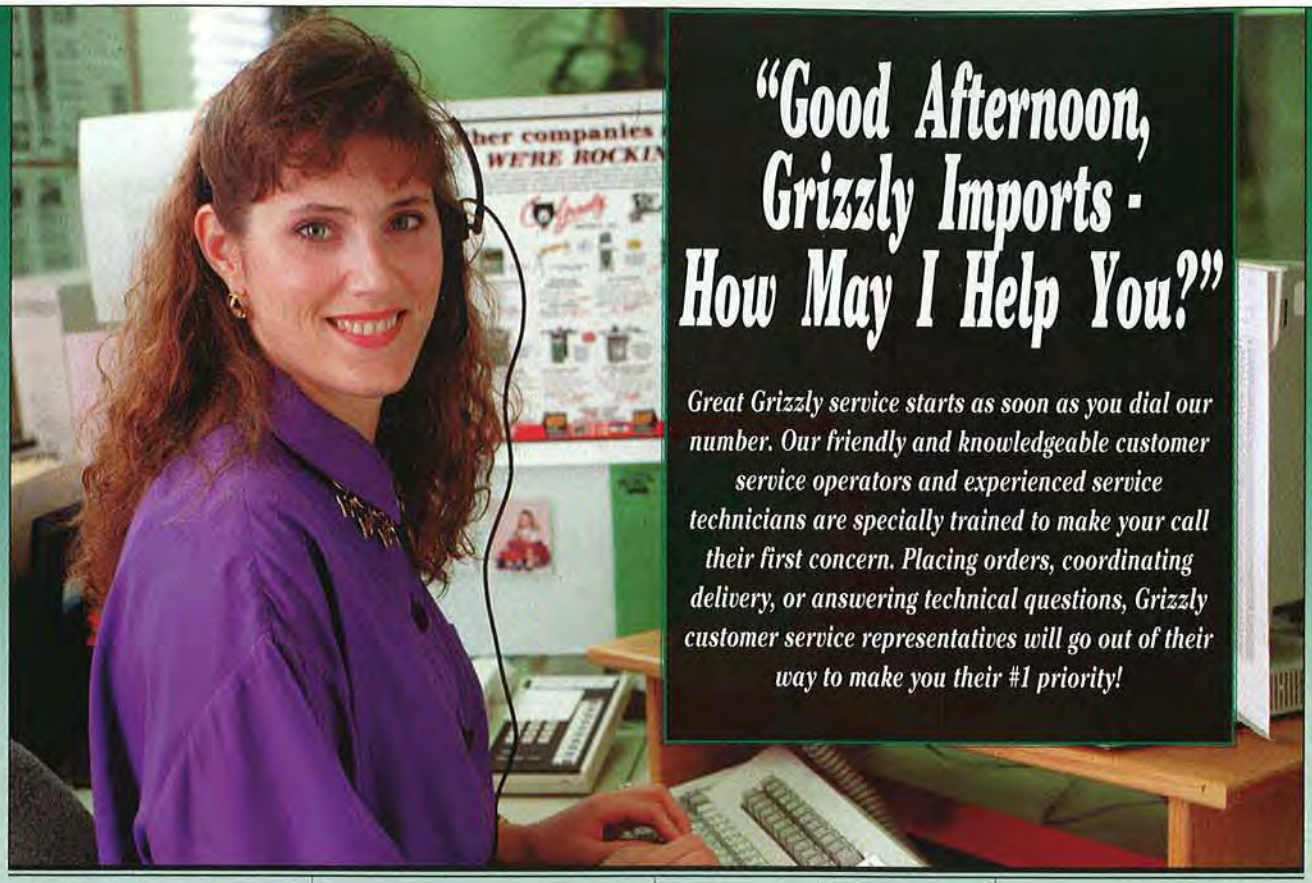

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THE EDITOR'S ANGLE

OK, I'll admit it; I'm a tree hugger

There was a time earlier in my life when I really didn't give trees their due. I noticed them, of course, but other than admiring their beauty, I didn't fully appreciate their value either in commerce or to woodworkers.

But *WOOD®* magazine has changed all that for me. In the course of editing this periodical for more than a decade now, I've done a fair amount of woodworking myself, and I've watched many species of wood take shape under the skilled hands of our project builders. And slowly, I've found myself becoming ever more fascinated by the wonderful diversity of this plant group. Now, I actively seek out new tree species and am genuinely interested in learning as much as I can about the trees I encounter.

This past fall, my wife and I went on an 11-day tour of London, Paris, and Rome to celebrate our 25th wedding anniversary. And in the latter two cities, we ran onto several interesting species in some unexpected places. In Paris, for example, within two blocks of the Eiffel Tower, as well as along some of the city's boulevards, we saw rows of neatly trimmed horse chestnut trees.

Our tour guide told us that their popularity stems from the fact that the species has proven itself resistant to pollution. That's quite a contrast to the American chestnut tree, which years ago was decimated by blight.

And along the roadways in Rome, we kept seeing rows of nicely sculpted pine trees that looked a lot like large umbrellas. They turned out to be stone pine trees, known for their large umbrella-shaped crown.

A row of stone pine trees (also called umbrella pines) lends a sophisticated air to an avenue near Rome's center.

Near the Catacombs (the underground burial site for 174,000 Christians in Rome), we ran across cypress trees, some hundreds of years old. And on the outskirts of Rome, we drove past groves of Russian olive trees, their branches loaded with olives almost ready for the harvest.

Of course, you needn't cross the Atlantic to appreciate the renewable resource that we use to create beautiful wooden objects. In fact, there's probably inspiration right in your own backyard.

If you'd like to learn more about various tree species, purchase or check out from your library one or both of the books listed below. Then, for starters, go outside, make a list of the species you have in your yard, and use your reference source to find out some interesting facts about them. I bet you'll get hooked on this fascinating part of our woodworking hobby. I know I am.

Collingwood, G.H., and Warren D. Brush. 1979. *Knowing Your Trees*. Washington, D.C.: American Forestry Association.

Peattie, Donald Culross. 1966. *A Natural History of Trees*. Boston: Houghton Mifflin Company.

Larry Clayton

Print this article

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This issue's cover wood grain: darrah darrah

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THIS SIDE OUT

4 teeth per chipper for super smooth flat bottom dadoes.

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When we listen to woodworkers, we understand what you mean — after all, we are woodworkers! You told us you needed a dado to cut plywood, solid wood, hardwood veneered plywood, laminates and melamine *chip-free*. You told us that it needed to cut precise slots and maintain accuracy. And it especially needed to accommodate today's undersized plywoods.

So we engineered a dado that would not only meet your needs, but would surpass your expectations. First we started with our superior tri-metal brazing to bond a special tooth design to an extra stiff blade body. You wanted dadoes with super smooth flat bottoms so we included 4-wing chippers. You said you hate it when chips build up in the chippers, so we perfected a gullet which ejects the chips. And then we eliminated the hub on the outside blade so chips cannot build up between the blades. The Super Dado will cut all your materials chip-free with a dado so smooth, you'll hate to cover it up.

To make it even better, we added something no other dado manufacturer has...a sixth chipper that is $^{3}/_{32}$" thick. That doubles the number of possible slot widths (from $^{1}/_{4}$" up to $^{29}/_{32}$" wide), and allows you to set the dado to fit today's undersized plywoods. To make it even more flexible, we've included a set of precision steel shims for fine adjustments. Here is a dado that matches the slot width flexibility of an adjustable dado while maintaining the safety and finish of a stacked dado system.

And speaking of safety, we used the same anti-kickback technology associated with our saw blades and router bits. It's the anti-kickback shoulder design that reduces the chance of kickback from overfeeding. This higher level of safety lets you dado with confidence.

We also packaged all this in a sturdy carrying case. Once you use this new dado, you'll agree that it really is a *Super Dado*.

Exclusive 3/32" Chipper lets you perfectly adjust the width of the cut for today's undersized plywood.

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Circle No. 1321

What woodworkers need to know

A few points on nails

Nails rank among the oldest of fasteners. Today they're one of the most widely used methods for joining wood and fastening things to it.

The Big Four of nails

Of all the kinds of nails, four account for most use: common nails, box nails, casing nails, and finishing nails. Of these, you'll probably use box nails and finishing nails most frequently.

Common nail. This is the basic flat-headed steel nail. The largest-diameter nail, it's used for rough construction and general carpentry. Because it's so fat, it's more likely to split your stock. More on avoiding that later.

Box nail. Thinner than a common nail of the same length, the box nail doesn't split the stock as readily as a common nail, but it also generates less holding power. Resin-coated (called cement-coated, or CC) and vinyl-coated box nails grip better than plain ones. For outdoor projects, use galvanized box nails.

Casing nail. Essentially a box nail with a small, inverted-cone head, the casing nail is intended for attaching interior and (in its galvanized version) exterior trim on buildings. You can either drive the small head flush or countersink it with a nailset.

Finishing nail. This thin, small-headed nail comes into play for installing moldings and other interior trim. Finishing nails come in handy for assembling boxes and other projects, too. Usually, you countersink the head and fill the hole with putty to hide the nail.

What's this *penny* deal?

While you might get away with asking for "number-8 nails" or even holding your index finger and thumb an appropriate distance apart while asking for "some nails about this long," talking pennies makes more sense to the hardware dealer. That's because the sizing unit for nails is the *penny*, abbreviated, as with British money, by the small letter *d* (8-penny or 8d).

Today, the penny designation refers solely to the length of a nail. Sizes from 2d to 60d cover a range of lengths from 1" to 3½" in ¼" increments, then on to 6" in ½" steps, as shown on the chart, *opposite page*.

Some say that penny designations centuries ago referred to the weight of a quantity of nails. Others hold that the number stood for the price of 100 nails (if 100 nails sold for 8 pence, they were 8d nails).

Some ways to avoid splitting headaches

Driving a nail into wood has much the same effect as driving in a wedge. The sharp point of the nail forces the wood fibers apart, often causing the wood to split. The tactics below will minimize chances of splitting.

•***Use thinner nails.*** Choosing box nails instead of common nails lessens the likelihood of splitting. For better holding power use CC or vinyl-coated ones.

•***Blunt the point.*** Before you drive a nail, stand it on its head and rap the point with your hammer. The blunted tip then tears through wood fibers rather than wedging between them.

•***Stagger nails.*** Instead of placing nails for tidy looks, drive them through different grain lines, as *below*. Nail as far from the end of the stock as possible, taking both pieces of wood into account.

•***Avoid knots.*** Driving a nail into a knot or the hard area adjacent to one will almost certainly split the wood. It's the surest way to end up with that standard item of woodworking cartoons—a split board with a bent nail stuck in it.

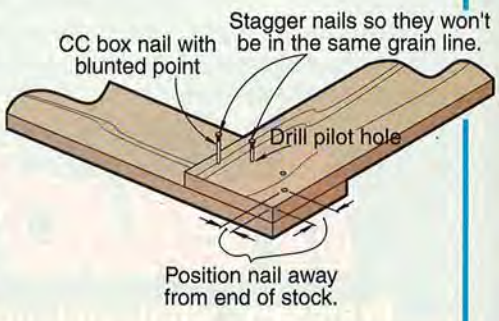
•***Drill a pilot hole.*** Make it about 85 percent of the nail's diameter and around half to two-thirds its length. For a 6d box nail, that's a 5/64" hole 15/16" deep; an 8d box, 3/32×1⅜"; a 16d box, 7/64×2¼".

For smaller nailing jobs

Use wire nails or brads when the smallest penny-sized nails are too large. Wire nails, which have flat heads, and brads, with heads like finishing nails, generally come in boxes or tubes of a few ounces.

Sizes such as ½"×19 designate the length (½") and wire gauge, or diameter, (19). A larger wire-gauge number indicates smaller diameter. Thus, a ½"×17 wire nail is fatter than a ½"×19 wire nail.

See nail chart on page 6


CC box nail with blunted point
Stagger nails so they won't be in the same grain line.
Drill pilot hole
Position nail away from end of stock.

Illustrations: Roxanne LeMoine; Jim Stevenson

Plane and simple.

It looks like a planer, but that's just half the story. JET's new combination tool both planes and molds—with a simple change of cutters. Offering a 13" planing capacity and more than 40 molding cutter sets, the JET planer/molder is two tools for the price of one: about $799. Plus, JET will send you a $50 rebate when you buy before 2/28/96.

Call 1-800-274-6848 to receive a free demonstration video showing planing and molding, or for the name of your local JET distributor.

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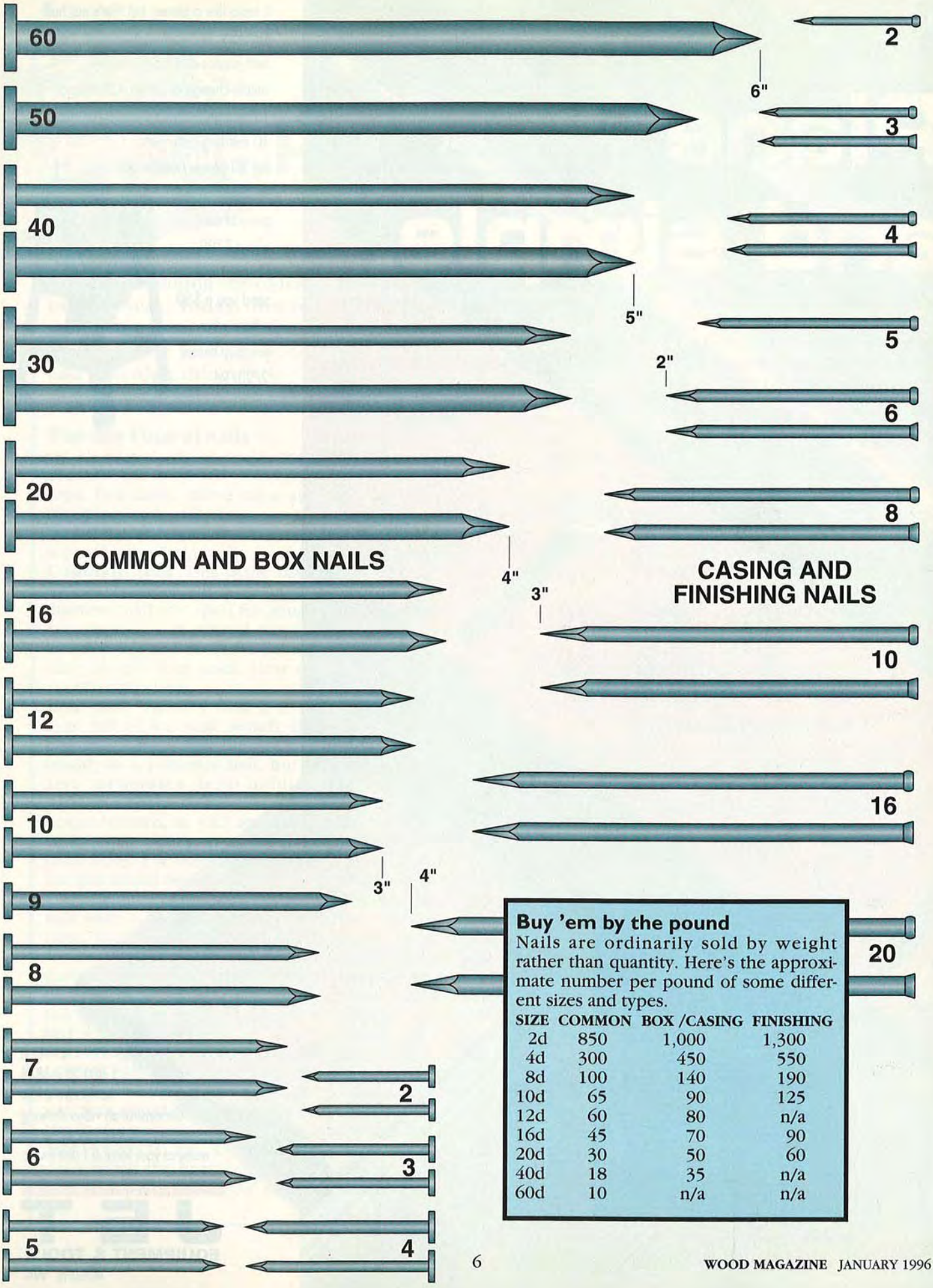

Buy 'em by the pound

Nails are ordinarily sold by weight rather than quantity. Here's the approximate number per pound of some different sizes and types.

SIZE	COMMON	BOX /CASING	FINISHING
2d	850	1,000	1,300
4d	300	450	550
8d	100	140	190
10d	65	90	125
12d	60	80	n/a
16d	45	70	90
20d	30	50	60
40d	18	35	n/a
60d	10	n/a	n/a

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TIPS FROM YOUR SHOP (AND OURS)

This month's prizewinner took our idea and made it better.

Most shop tips come through the mail. Occasionally, though, they walk in the front door.

When Joe Ransom visited our offices in Des Moines last winter, he brought along a few jewelry boxes he had made based on an article in the December 1993 issue of *WOOD®* magazine. But rather than use a ¼" dowel for the pivot hinge, Joe grabbed a finish nail and cut some screw threads on the pointed end with a die. This enabled him to make much smaller boxes than a ¼" dowel would allow.

We liked Joe's idea so well we awarded him the top shop tip of the month. If you have a good shop tip, we want to hear from you, too—in person or via the mail. Just send (or bring) a description of the idea and a drawing or photo to:

Tips From Your Shop (and Ours)
***WOOD®* Magazine**
1912 Grand Ave.
Des Moines, IA 50309-3379

We try to publish original shop tips, so please send your idea to only one magazine. Also note that we cannot return your submissions. Thanks, and keep those shop tips coming.

Tom Jackson
General-Interest Editor

Finish nail provides pivot hinge for small projects

You need a long, narrow pivot hinge for a pair of stacked trays or other projects that open horizontally. But screws won't do, and an ordinary nail won't stay in place. What do you do?

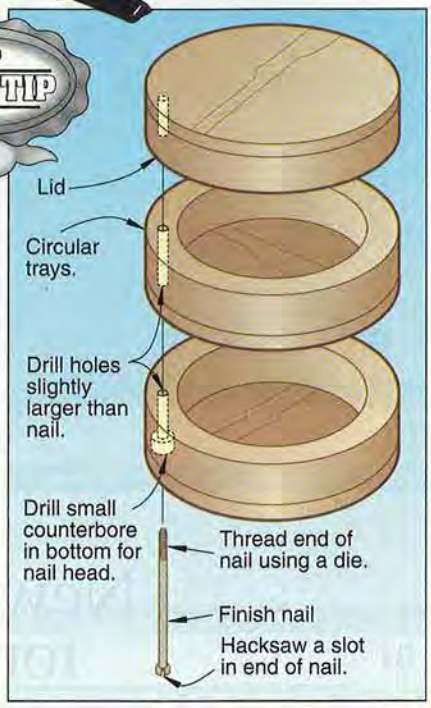
With a metal die you can turn a finish nail into the perfect pivot hinge. Cut enough threads onto the end of an 8d finish nail to penetrate two-thirds of the way into the lid of the stacked trays. Then, use a hacksaw to make a kerf in the head of the nail that will fit a slotted screwdriver tip.

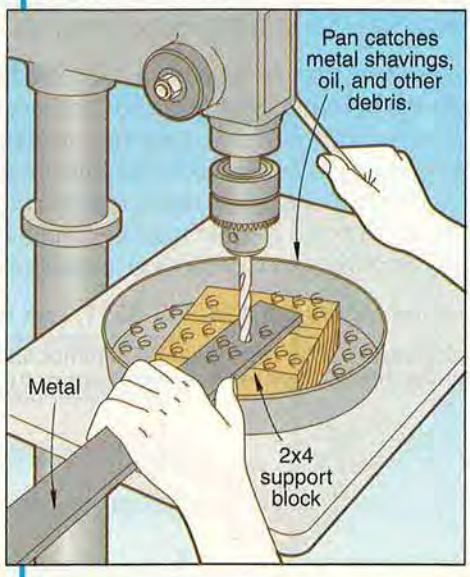
TOP SHOP TIP

Next, clamp the segments of the box together in the closed position, and drill the pilot holes and a counterbore near the edge of the stack as shown *right*. The first two pilot holes should measure slightly larger than the nail and penetrate the base and middle tray. The second pilot hole should measure about 25 percent smaller in diameter than the shaft of the nail and penetrate two-thirds of the way through the lid of the box only. Now, push the modified nail through the larger pilot holes and screw the threaded end tight into the lid.

—Joe Ransom, Camarillo, Calif.

For submitting the best shop tip in this issue, Joe will receive a new Sears model 17706 16-gallon wet/dry vacuum.


Lid
Circular trays.
Drill holes slightly larger than nail.
Drill small counterbore in bottom for nail head.
Thread end of nail using a die.
Finish nail
Hacksaw a slot in end of nail.



Trap troublesome metal shavings with a pan

Even a tiny sliver of steel, iron, or other metals will leave an ugly stain if allowed to sit for long on top of a piece of unfinished wood. And metal shavings hidden in your sawdust can do serious damage if they get pulled into your dust-collection system and strike the impeller blades.

To prevent these problems, put a shallow pan under your workpiece any time you drill into metal. In the middle of the pan, support the workpiece with a backer block the same height as the edge of the pan.

—Joe Seibert, Bryan, Ohio

Continued on page 10

Print this article

Craftsman's Most Powerful Vac... Wet or Dry

With six peak horsepower, Craftsman's new wet/dry vac is the most powerful, detachable blower vac on the consumer market.

It's at home in your workshop, kitchen, garage... even in the yard, thanks to the detachable blower that cleans up leaves and yard debris with a 200 MPH blowing velocity.

To complement its power, we developed a sturdy vac caddy supported by oversized wheels to resist vac tipping. There's an extra-long 20-foot cord and convenient on-board accessory storage so tools are always right at hand. The large 16-gallon capacity, built-in drain and reusable filter make cleanup a breeze. Accessories include two extension wands, four nozzles, blowing diffuser and blower adapter.

Check out this new detachable blower vac with 6 peak horsepower at your Sears store, or for convenience, call the "Sears Shop at Home" service, 1-800-377-7414.

Continued from page 8

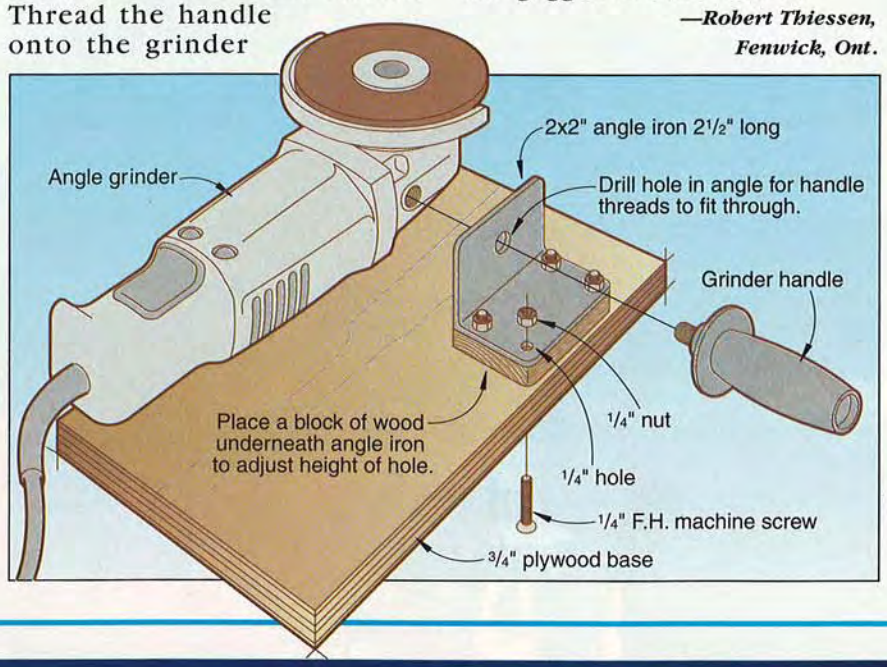
Hold grinder to benchtop with a scrap of plywood and some angle iron

You can double the usefulness of an angle grinder by attaching it to a stationary surface. Once mounted, you can use the grinder to sharpen cutting edges on tools and to polish or de-burr small pieces of metal.

First, remove the handle from the angle grinder and lay it upside down on a piece of plywood as shown. Place a piece of angle iron alongside the grinder, and mark the location where the handle attaches to the body. If necessary, elevate the angle iron with a small block of wood. Depending on the make and model of your grinder, you may need to modify the shape of the angle iron to gain access to the switch.

Now, drill a hole in the vertical surface of the angle iron that's large enough for the threaded handle stud. Also drill four holes in the horizontal surface to mount the angle iron to the plywood. Attach the angle iron to the base with machine screws. Thread the handle onto the grinder through the hole in the angle iron and you're in business. When using the grinder, wear protective goggles or a face shield.

—Robert Thiessen, Fenwick, Ont.


Angle grinder
2x2" angle iron 2½" long
Drill hole in angle for handle threads to fit through.
Grinder handle
Place a block of wood underneath angle iron to adjust height of hole.
¼" nut
¼" hole
¼" F.H. machine screw
¾" plywood base

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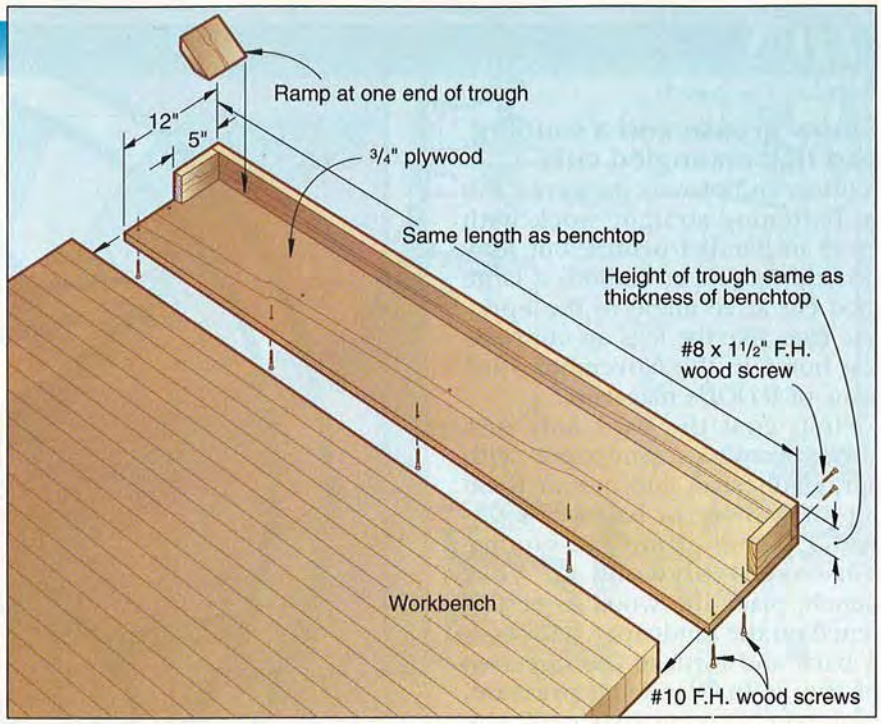
Old-World carver's trough works on modern benches

A trough like the one on many European-style workbenches can provide modern woodworkers with a lot of convenience, too. When your bench gets too crowded with screws, brads, and hardware, you can simply sweep them into the trough rather than stop to clean and sort through everything. The best news of all is that you don't have to buy an expensive bench to get one of these troughs. Just add one to the bench you have now. To make this workbench add-on, size the sides and front edge of the trough to match the depth of your benchtop. Glue and screw the sides and front edge of the trough together, and then glue and screw these to a piece of ¾" plywood as shown. Now, fasten the plywood to the underside of your benchtop with glue and screws. Pare down the edges of the box with a handplane if necessary to ensure that it sits level with the top of your bench. You also can add an angled ramp at one end to make cleaning easier.



—From the WOOD® *magazine shop*

Continued on page 12

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TIPS FROM YOUR SHOP (AND OURS)

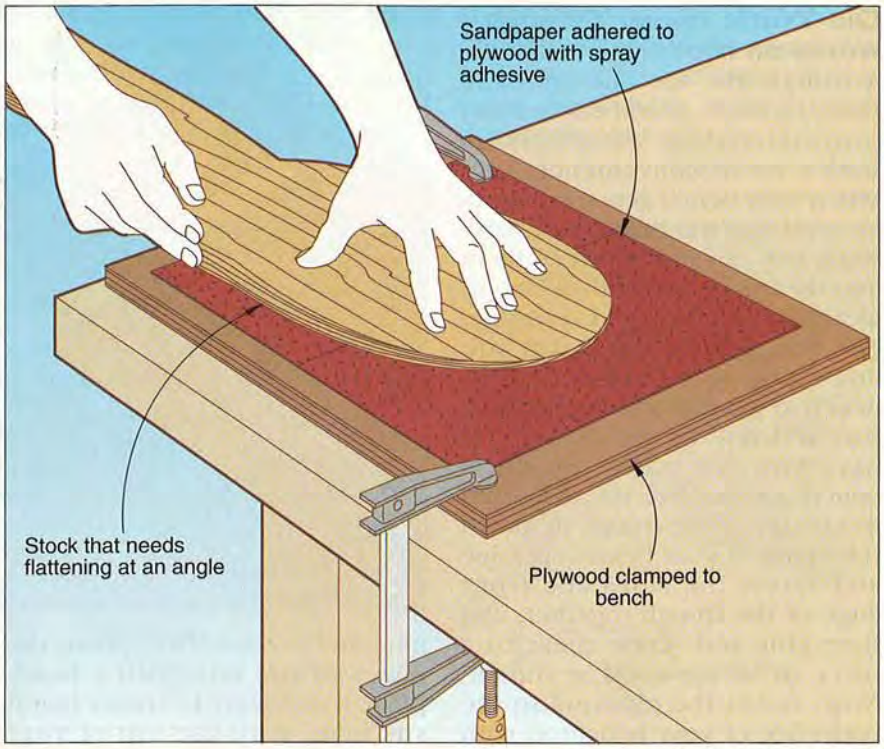
Continued from page 11

Elbow grease and a sanding pad flatten angled cuts

Jointers and planers do a great job of flattening straight stock with faces in parallel planes. But how do you flatten or smooth a large face cut at an angle to the opposite face, like the legs on our rocking horse in the November 1995 issue of *WOOD®* magazine?

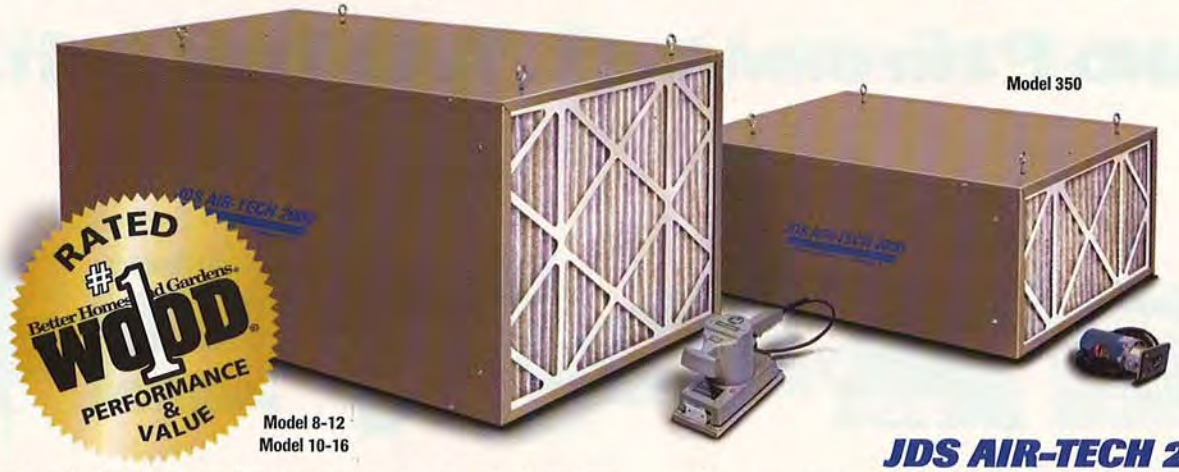
First, coat the back side of a sheet or two of sandpaper with spray adhesive, and mount them on a flat piece of hardwood plywood. Then, clamp the sandpaper-coated plywood to your bench, place the wood to be flattened on the sandpaper, and work it back and forth in the direction of the grain. Use even pressure, and take care not to rock the workpiece. With careful sanding you can level the workpiece as flat as the surface of the plywood.

—From the WOOD magazine shop



Continued on page 14

Give Yourself Some Breathing Room.



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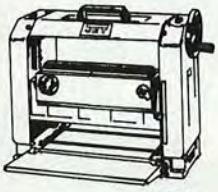

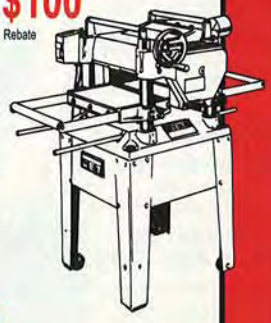

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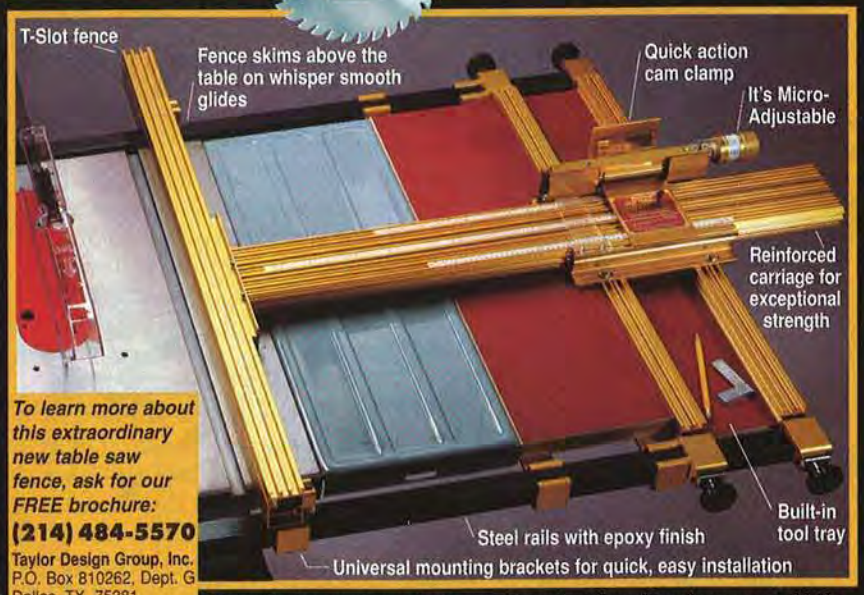
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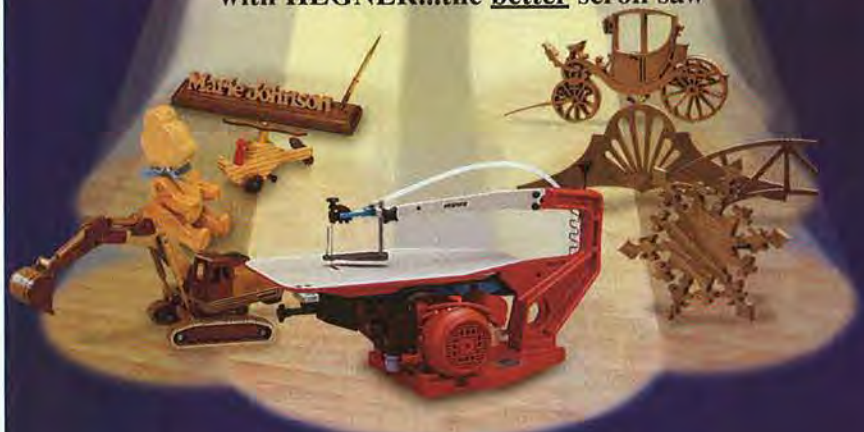

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Circle No. 3

TIPS FROM YOUR SHOP (AND OURS)

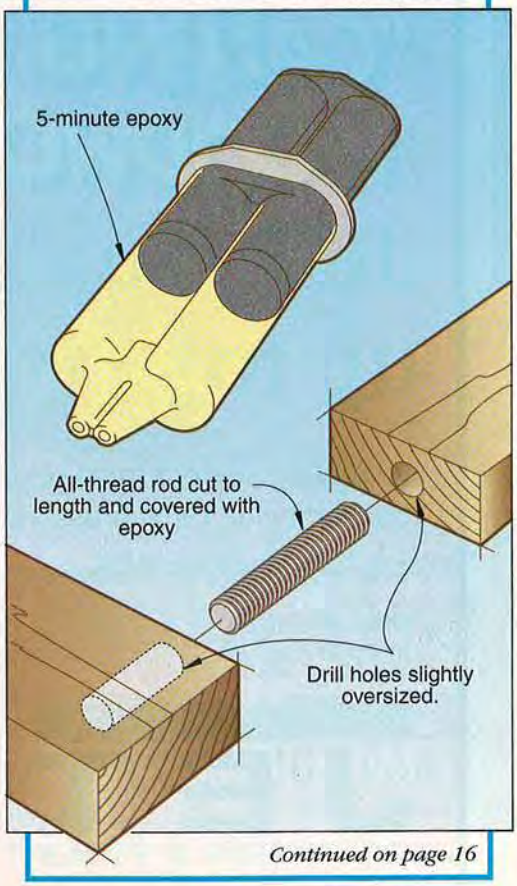
Continued from page 12

Do your doweling with all-thread rod and epoxy

For a super-strong joint that doesn't require a lot of precise fitting, try using epoxy and all-thread rod as a substitute for dowels and woodworker's glue. Drill your holes in the same location as you would for a dowel assembly, but make the holes about 1/16" larger than the diameter of your all-thread rod.

Now, thoroughly coat your all-thread "dowel" and fill each hole about a third of the way to the top with 5-minute epoxy. Assemble the joint so that the excess epoxy fills the gaps between the hole and the all-thread rod, align the pieces, and clamp. The gap between the all-thread rod and the sides of the hole gives you a margin of error so you can reposition pieces for a better fit. And since epoxy can fill gaps while retaining its structural integrity, the strength of your joint is not compromised.

—Gordon Little, Duvernay, Quebec



Continued on page 16

CMT®

The cutting tool source!

Carbide Tipped Blades

Item	Primary Function	No. of Teeth	List	Sale
10" diameter, 5/8" arbor:				
110-240	Ultra-smooth Ripping	24	$60.00	$51.00
210-240	*Thin-kerf* Ripping	24	$69.00	$58.65
110-500	Maxi-Combo™	50	$78.40	$66.60
110-600	General Purpose	60	$84.40	$71.70
210-500	Maxi-Combo Lite™	50	$79.00	$64.90
210-600	*Thin-kerf* Fine	60	$84.40	$71.70
110-800	Ultra-Cut™	80	$100.90	$85.80

Miter Blades with -5° hook!

Item	Blade Diam.	No. of Teeth	Arbor Size	List	Sale
185-048	8-1/2"	48	5/8"	$59.40	$50.50
185-600	8-1/2"	60	5/8"	$74.40	$63.20
110-801	10"	80	5/8"	$100.90	$85.80
112-901	12"	90	1"	$135.00	$114.75
114-100	14"	100	1"	$144.00	$122.40
115-100	15"	100	1"	$149.00	$126.65

Two-blade Packages. SALE!

110-221 List: $134.00
110-240 Rip & 110-500 Maxi-Combo — **$100.50**

110-223 List: $201.90
110-800 Ultra-Cut & 110-801 Miter — **$151.40**

110-224 List: $153.40
210-240 Thin Kerf 24T Rip &
210-600 Thin Kerf 60T Fine — **$115.40**

110-225 List: $185.40
110-600 60T General Purpose &
110-800 80T Ultra-Cut — **$138.90**

110-228 List: $178.00
110-800 80T Ultra-Cut &
210-500 50T Maxi-Combo Lite — **$128.50**

110-233 List: $179.30
110-500 50T Maxi-Combo &
110-800 80T Ultra-Cut — **$119.00**

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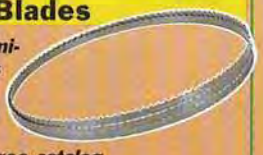

93-1/2" Blades fit Delta's 14" saws plus 14" saws by, Enlon, Elephant, Reliant, Grizzly & more!

Item	Width	Pitch	Style	Sale
BSB-931	1/8"	14 TPI	Std.	$16.10
BSB-932	3/16"	4 TPI	Skip	$13.00
BSB-933	3/16"	10 TPI	Std.	$13.00
BSB-934	1/4"	6 TPI	Skip	$12.50
BSB-935	3/8"	4 TPI	Skip	$12.50
Heavy-duty resaw blades:				
BSB-936	3/4"	3 TPI	Hook	$15.70
BSB-937	3/4"	3 TPI	Skip	$15.70
BSB-938	3/4"	6 TPI	Std.	$15.70
BSB-939	3/4"	10 TPI	Std.	$15.70
BSB-930	1"	3 TPI	Hook	$17.50
BSB-193	1"	8 TPI	Std.	$17.50
BSB-293	1"	14 TPI	Std.	$17.50

Save on our package of five 93-1/2" blades
Includes one each: 1/8"x14TPI, 3/16"x10TPI Std., 1/4"x6TPI Skip, 3/8"x4TPI Skip, 3/4"x3TPI Hook.
BSS-951 Save over 10%! SALE $62.00

105" Blades
Fits Inca 710, Delta, Jet & other 14" extended

Item	Width	Pitch	Style	Sale
BSB-101	1/8"	14 TPI	Std.	$17.30
BSB-102	3/16"	4 TPI	Skip	$13.90
BSB-103	3/16"	10 TPI	Std.	$13.90
BSB-104	1/4"	6 TPI	Skip	$13.00
BSB-105	3/8"	4 TPI	Skip	$13.00
Heavy-Duty resaw blades:				
BSB-106	3/4"	3 TPI	Hook	$17.00
BSB-107	3/4"	3 TPI	Skip	$17.00
BSB-108	3/4"	6 TPI	Std.	$17.00
BSB-110	1"	3 TPI	Hook	$18.80
BSB-111	1"	8 TPI	Std.	$18.80
BSB-112	1"	14 TPI	Std.	$18.80

Save on our package of five 105" blades
Includes one each: 1/8"x14TPI, 3/16"x10TPI Std., 1/4"x6TPI Skip, 3/8"x4TPI Skip, 3/4"x3TPI Hook.
BSS-151 Save over 10%! SALE $66.20

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800-640
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Rabbet-Master Plus $39.90

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Planer & Jointer Knives

High Speed Steel Specialty Knives Perfectly match your planer or jointer!

Item	Knives	Fits	Sale (set)
SPK-005	2	Ryobi JP155	$48.50
SPK-025	2	Ryobi AP10	$49.40
SPK-030*	2	Makita 2012 planer	$38.50
SPK-035	2	Ryobi AP12 planer	$45.80
SPK-040	2	Ryobi AH-115 & AH-125	$91.30
SPK-045	2	Makita 2030N planer	$63.40
SPK-055*	2	Delta 22-540	$45.40
SPK-060	2	Makita 2040	$77.80

*Double Edged Knife

HSS Knives
A keen edge that's ideal for hard or soft wood
(Number of knives in parenthesis)

Item #	Description	Sale
SJK-005	4" Knives for Delta,Craftsman,other (3)	$16.30
SJK-010	6" Knives for old Delta, Craftsman (3)	$24.00
SJK-012	6" Knives for Grizzley (3)	$24.00
SJK-015	6-1/16" Knives for Delta DJ-15 (3)	$25.10
SJK-020	8" Knives for old Delta & Rockwell (3)	$31.80
SJK-025	8-1/16" Knives for Delta DJ-20 (3)	$32.60
SJK-030	12" Knives for Powermatic (3)	$46.10
SJK-035	12-1/2" Knives for RBI 612 & 812 (2)	$44.90
SJK-040	12-1/2" Knives for Grizzly & other (2)	$45.90
SJK-045	13-1/8" Knives for Delta RC-33 (3)	$52.10
SJK-055	15" Knives for Grizzly, other imports (3)	$58.20
SJK-057	16" Knives for SCMI jointer (4)	$82.60
SJK-065	20" Knives for Parks 20" planer (4)	$101.60
SJK-070	20" Knives for Delta 20" & others (4)	$103.30
SJK-075	20-1/2" Knives for RBI 820 (3)	$78.70

Carbide Tipped Knives
Ideal for abrasive materials like plywood & particleboard.
(Number of knives in parenthesis)

Item #	Description	Sale
SCK-005	4" Knives for Delta,Craftsman, other (3)	$58.90
SCK-010	6" Knives for old Delta, Craftsman (3)	$80.10
SCK-012	6" Knives for Grizzley (3)	$80.10
SCK-015	6-1/16" Knives for Delta DJ-15 (3)	$89.10
SCK-020	8" Knives for old Delta & Rockwell (3)	$117.00
SCK-025	8-1/16" Knives for Delta DJ-20 (3)	$118.30
SCK-030	12" Knives for Powermatic (3)	$193.60
SCK-035	12-1/2" Knives for RBI 612 & 812 (2)	$122.10
SCK-040	12-1/2" Knives for Grizzly & other (2)	$122.10
SCK-042*	12-1/2" Knives for Delta 22-540 (2)	$193.50
SCK-045	13-1/8" Knives for Delta RC-33 (3)	$193.10
SCK-055	15" Knives for Grizzly, other imports (3)	$196.90
SCK-057	16" Knives for SCMI jointer (4)	$279.90
SCK-065	20" Knives for Parks 20" planer (4)	$392.70
SCK-070	20" Knives for Delta 20" & others (4)	$416.90
SCK-075	20-1/2" Knives for RBI 820 (3)	$274.70

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Circle No. 615

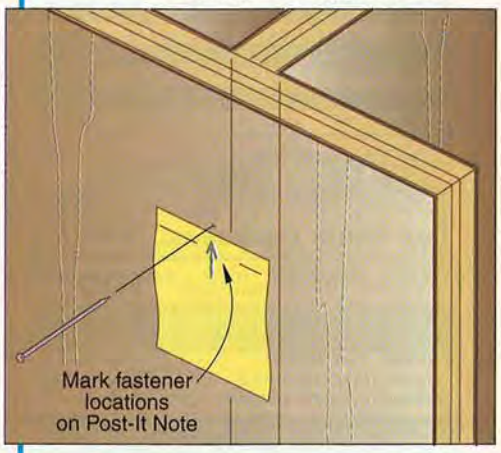
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 14

Post-It Notes mark the location of hidden nailers

To mark the location of a stud or a hidden nailer, use a 3M Post-It Note or a similar adhesive-backed paper tab. These squares of paper can be left in place for days, they won't leave a pencil mark on your wall or project, and they won't peel up paint or finishes as masking tape might. What's more, you can draw level lines across the squares of paper to aid in the installation of shelves.

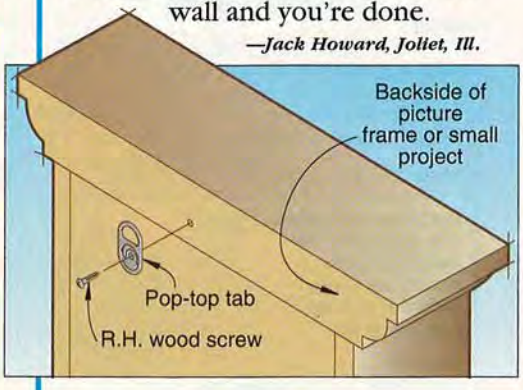
—Randy Lee, Fairfield, Ohio



Pop-top tab proves perfect for hanging small projects

You want to hang a small frame on your wall, but using two eye screws and a wire won't work. Chill out and grab a can of soda pop. When you're done with the drink, pull the pop-top tab off the can with a pair of pliers. Drive a small screw through the rivet hole in the tab to fasten it to the back of your project. Hook the larger hole on the tab over a nail in the wall and you're done.

—Jack Howard, Joliet, Ill.



Hand-rubbed finishing technique is in the bag

You could spend a lot of money on oil and pumice to get a hand-rubbed look on a varnish finish. But a brown paper bag will do a nice job as well.

Cut out a section of a bag, and wad it up a few times to soften the surface. Then, fold it into a flat pad that fits your hand comfortably, and use it to rub your finish. The paper will knock down any small dust nibs and give you an even, matte finish.

—Alan Bakke, Forrest Lake, Minn.

A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Catching a tool can mar your turning, sometimes ruining it. In spindle turning, a simple substitution for your spur center can prevent this trouble. Find out how on *page 66*.
- Clamping odd-shaped pieces often proves tricky. Check out *page 53* to see how we held the parts of a fretwork whatnot together while the glue dried.
- If you don't have a bench hook, you don't know what you're missing! On *page 73*, we show you how to build one.

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WOOD ANECDOTE

Print this article

PAPER BIRCH

The tree that gave and gave

In the days when voyageurs paddled the lakes of the United States and Canada, there were seemingly unlimited beaver, mink, and muskrat. The waters swarmed with fish. Deer, moose, and elk browsed in abundance and roamed through great stands of bone-white birch trees (*Betula papyrifera*). Like the fish and game, the trees provided the native people with essentials.

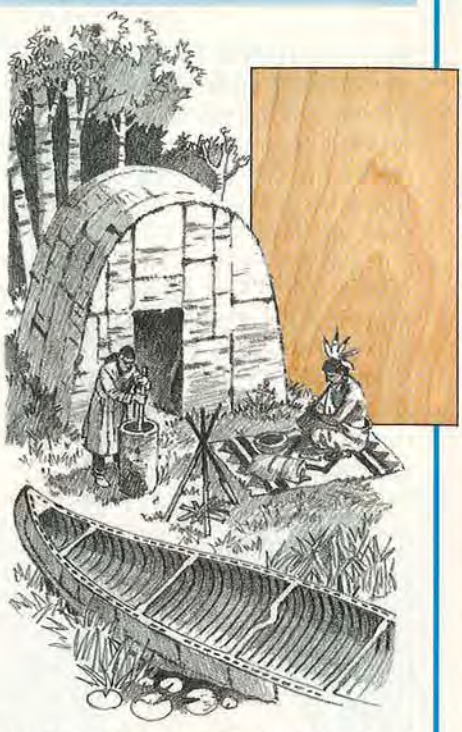
Paper birch, as it came to be called because of its paperlike curls of outer bark, yielded a complete bark layer thick enough to skin canoes. But the easily peeled, tough material also became sheathing for lodges. Campfires began with fast-burning kindling made from bark shavings. Tightly tied into a taper, the leather-like bark slowly smouldered to ward off swarming mosquitoes.

The paper birch also was tapped for sweet sap every spring. When chewed, its small twigs were aspirin-like in relief. Even the branches were bent and formed into snowshoe frames.

To the lumbermen of later years, however, the paper birch's wood was of little use. Yet, in imitation of the first inhabitants, they made the bark into waterproof roof liners. In their leisure, it became postcards to send home, baskets, and tiny canoes.

Today you'll find paper birch's workable wood as dowels, toothpicks, and clothespins. Its bark has no common present use.

Illustration: Jim Stevenson



To the Native Americans, birch bark was for home and travel.

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TALKING BACK

We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, *Better Homes and Gardens*® *WOOD*® Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. To contact us via computer, use these on-line addresses: *CompuServe*: 74404,3516 Internet: 74404.3516@compuserve.com

How to calculate the side length of a polygon

The side length of the hexagon that was shown in the "How wide is that side?" reader letter in the August 1995 issue equals the radius of the circle that encloses the hexagon. However, finding the length of sides on regular polygons with other than six sides usually requires the use of trigonometry. I have calculated the following table to make it easier for your readers to determine the side length. Just take the listed multipliers times the radius of the enclosing circle to find the side length of any regular polygon!

—Gordon Du Floth, Grass Valley, Calif.

Number of sides	Miter Angle	Multiplier
4	45°	1.414
5	36°	1.1755
6	30°	1.000
7	25.71°	.8677
8	22.5°	.7854
9	20°	.684
10	18°	.618
11	16.36°	.5633
12	15°	.5176

To find the side length, multiply the radius x the multiplier. (L=R x M)

To find the radius, divide the side length by the multiplier. (R= L÷M)

Thanks to Gordon and the many other readers who sent letters containing similar tables and techniques for finding the side length of a regular polygon. Here's a compilation of the tables sent in by all you good folks. Just plug the figures into the appropriate formula shown at the bottom of the chart.

A simpler way to find the side length of a hexagon

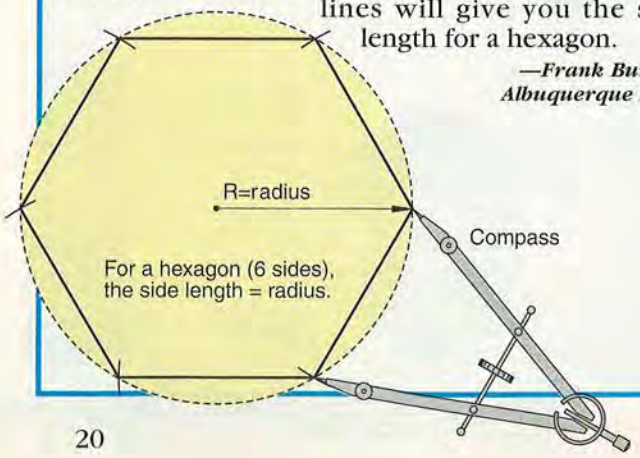
I read with interest the answer to "How wide is that side?" in the August 1995 Talking Back, and I have a useful method for laying out a six-sided project. Here's how it works:

1 Draw a circle with your compass set to ½ of the project width.

2 Place the pointed end of the compass on the circle, and strike an arc that intersects the circle. Move the compass point to the pencil mark, and draw another arc. Continue this around the circle.

3 Draw lines from arc to arc on the circle. These lines will give you the side length for a hexagon.

—Frank Burton, Albuquerque N. M.



Computers and woodworking: where to find the miter calculator

In our November 1995 article "Home Computers, 7 Ways They Can Help Your Woodworking," we mentioned a miter-calculator program which some readers are having difficulty locating. You can find the program in the America Online (AOL) software library.

To get into the software library, open up the menu listings under "GO TO," scroll down to the "SEARCH SOFTWARE LIBRARIES" line, open that window, and type "MITER" in the keyword section. The program is listed in the "ENGINEERING & SCIENCE" category under the subject "MITER: V1.3A ANGLE CALCULATOR with a file name of "MITER.ZIP." (The "ZIP" suffix means that you'll also have to download the "ZIP" software from America Online in order to use this and other "zipped" programs from AOL.) If you don't have the AOL service, you can order the program on a floppy disk directly from the author by sending a check for $25 to: Carl Shafer, 2717 Turtle Creek Dr., Hazel Crest, IL 60429.

And speaking of computers, thanks to all those readers who corrected our inflated definition of a "byte." For the record, a "byte" is a single unit of information such as a number, letter, space, or punctuation mark.

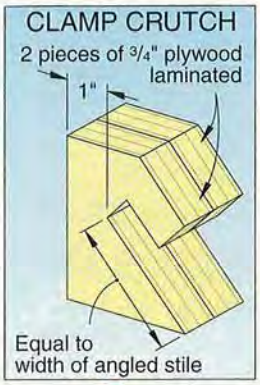
—Tom Jackson, General-Interest Editor

Patented dado shim set available directly from Veritas

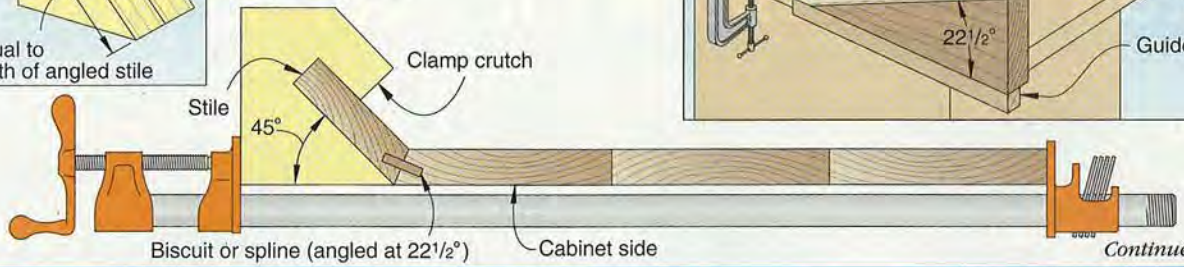
In our article "Shims: the secret to making dadoes fit" in the October 1995 issue of *WOOD*® magazine, we showed a dado shim set made by Veritas. However, we neglected to advise readers that this product is protected by patent number 5,316,061, and that the set is sold by Veritas Tools for $6.95. To order, call 800/667-2986.

Simplified angle gluing

I loved the article "Corner Classic" in the November 1994 issue. However, I have been building wall-mounted corner cabinets for a number of years, and have developed a process that makes the clamping and gluing of the 22½° beveled stiles to the beveled sides much easier.

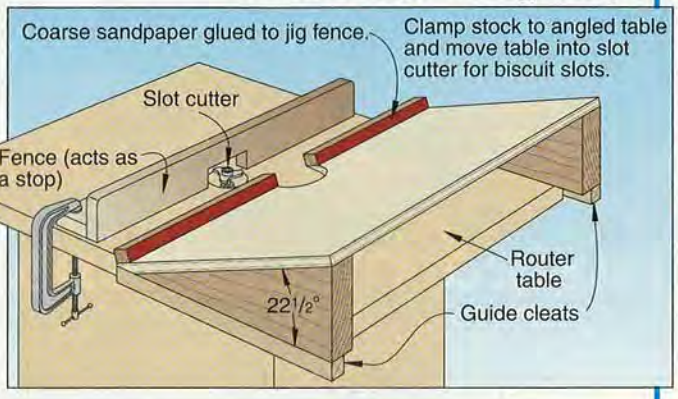


First, to eliminate slippage problems while clamping this joint, I cut biscuit slots into the beveled edge of the sides and stiles. To do this, I use the 22½° jig shown *right* and a slot-cutter bit mounted in my router table. You can also substitue a spline for the biscuits to reinforce this joint.



Second, I use several shop-built 22½° clamp crutches (as shown in the drawing *left)* to draw the miter joint together and to apply even pressure along the joint line. These crutches help maintain the stiles at the proper angle to the sides while the glue dries.

—Frank Harland, Citrus Heights, Calif.


Coarse sandpaper glued to jig fence.
Clamp stock to angled table and move table into slot cutter for biscuit slots.
Slot cutter
Fence (acts as a stop)
Router table
22½°
Guide cleats

Continued on page 22

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TALKING BACK

Continued from page 21

Dreaming of (and building) her own shop

I enjoy *WOOD®* magazine, and woodworking has provided me with years of enjoyment. Several of the Idea Shop® projects were used while I was creating my own workshop.

I am a Sister of Saint Joseph from Rochester, and an occupational therapist by profession. I was able to spend an entire summer working on an accessible housing project for our local chapter of Habitat for Humanity. The experience convinced me to look for a way of using more of my untapped woodworking talents. As a result, I now spend one day a week working with a local renovation contractor to improve my skills. And my confidence has increased enough to where I can tackle most of the *WOOD* magazine projects with good results.

My own woodworking shop started out in a small attic room with a jigsaw and a ¼" electric drill. This was followed by moving the shop to a more traditional basement location. However, as I acquired more tools and wood, the projects grew bigger, and the sawdust and noise began to interfere with the general living space.

During the summer of 1994, I was fortunate enough to acquire space for my wood shop in a

17×27' garage bay on our motherhouse property. I planned, framed, insulated, drywalled, and painted the space. Since September 1994, it has been an operating shop, although the work areas are still being rearranged for greater efficiency and storage. And in this new and wonderful space, I build Adirondack chairs, deck furniture, folding beach chairs, custom-sized bookcases, and cabinets. And the scrap wood becomes small craft items like clocks, candleholders, and boxes.

—Eileen Curtis, SSJ, Rochester, N.Y.

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5090DW	3-3/8" Cordl's Saw	144
5090D	tool only	80
5402A	16" Beam Saw	528

6211DWHE	NEW Cordless	194
6311DWHE	NEW Cordless	204
6406	3/8" Drill	53
9820-2	Sharpener	208
9901	3 X 21 Belt Sander	129
9924DB	3 X 24 Belt Sander	183
BO4510	Square Pad Sander	49
BO5000	Random Orbit Sander	68
JR3000V	Recip-Saw	138
LS1030	10" Miter Saw	205
1912B	NEW 4 3/8" Planer	189
N1900B	3" Planer Kit	129
N9501B	Mini Grinder Kit	98

BATTERY SPECIAL

9.6 V "Black" Battery	23.50
7.2 V "Black" Battery	22.00
12 V "Orange" Battery	39.00
ML900 9V Flashlight	36.00

AIR MAKITA

AN8300	Framing Nailer	439
AN451	Coil Roofer Nailer	398
AF501	Brad Nailer	277

Makita

MAC1000	1-1/2hp Compressor	299
MAC2000	2hp Oilless Compr'sst	354

Milwaukee

0225-1	3/8" Magnum Drill	$123
0228-1	3/8" 0-1000rpm Drill	111
0229-1	3/8" Keyless Drill	111
0234-1	1/2" Magnum Drill	130
0236-1	1/2" Magnum Kit	154
0238-1	1/2" 0-850rpm Drill	128
0239-1	1/2" Keyless Drill	128
0244-1	0-600 rpm Magnum	130

0375-1	3/8" Close Qtr Drill	134
0379-1	1/2" Close Qtr Drill	148

0407-1	Cordless Drill Kit-2batt	172
0422-1	12V Cordl's HammerDrill	245
0567-1	Drain Cleaner	234
3300-1	Rt Angle Drill	193
3107-1	VS Rt Angle Drill	218
5192	Die Grinder	174

DEWALT

DW682K Biscuit Joiner $218

DW100	3/8" Drill	67
DW106	3/8" Keyless Drill	73
DW411	Palm Sander	58

DW930K	Cordless Saw	198
DW935K	Cordless Saw	219
DW972K2	12V Cordless drill	188
DW974K	14V Cordless drill	198

DW705 12" Compound $358

6494 10" Compound Miter $315

5362-1	1" Hawk Hammer	328
5365-1	1" Hawk Hammer Kit	348
5369-1	3/4" D-handle Falcon Kit	238
5371-1	1/2" Hammer Drill	178
5375-1	1/2" Hammer Drill Kit	187
5392-1	3/8" Hammer Drill	126
5397-1	3/8" Hammer Drill Kit	148
5460	7" Polisher	174

5682	2 Hp Router	168
5936	4 x 24 Belt Sander	227
6008	1/3 Sheet Sander	123
6010	1/2 Sheet Sander	127
6142	4 1/2" Grinder Kit	123
6148	NEW Mini Grinder	96
6175	14" Chop Saw	278
6266	NEW!! Jig Saw	187
6365	7-1/4" Circular Saw	121
6366	6365 w/Carbide bld	128
6368	7-1/4" Saw Kit	138
6460	10" Circular Saw	268
6491	10" Miter Saw w/80t Bld	278
6527	VS Super Sawzall	171
6528	VS Super Sawzall	169

6539-1	Inline Screwdriver	74
6546-1	2 spd Inline Screwdriver	81
6758-1	Drywall Screwgun	98
6767-1	Screwdriver Kit	137
8975	Heat Gun	58
8980	Heat Gun Kit	91

6535 Dual range VS Sawzall $115

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94-100	5 pc Router Bit Cabinet set	$158
JS102	New Biscuit Joiner	178
EDS132B	13V Cordless Drill	208
TR215	8"Compound MiterSaw	359
LU85M010	10" 80T Finish	58
LU84M011	10" 50T Combo	40
LM72M010	10" 24T Rip	38
LU85M015	15" 108T Finish	99
LU82M010	10" 60T Chipboard	45
LU89M010	10" 72T Aluminum	57
LU92M010	10" 60T Corian®	58
LU96M010	10" 80T Laminates	67
LU73M010	10" 60T Crosscut	45

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The *NEW!!!* world's best feet-inch-metric-fraction calculator. Solves rafters hips, valleys, stairs

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Extra Drill bit		15.95
Face Clamp		15.95
100 Screws		3.25
Driver Bit		2.95

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HS40	40" Home Shop	208
Miter saw Stop		69

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C8FB2 COMPOUND SLIDE SAW $577

$30 rebate on C8FB call for details

C10FA	10" Miter Saw	269
C10FC	10" Comp'd Miter	258
C10FS	10" Slide Miter	739
C15FB	15" Miter Saw	669
NR83A	Framing Nailer	398

Clamp 'n Tool Guide		Back-to-Back Bench Clamp	
50C	$ 29.50	BB50	$ 45.95
36C	26.50	BB36	37.95
24C	22.50	BB18	31.95

Panasonic

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EY6100EQKW *PREDATOR* IRONMAN w/2 Batteries 224

EY6100CQKW *PREDATOR* 15Min.Charge w/2 Batteries 198

SMARTLEVEL

SL224	2' economy Level	$ 54
SL248	4' economy Level	64
PR24S	2' Pro Level w/case	88

AEG

STSE380	Jig Saw	59
VS280	1/2 sheet sander	39

6 in 1 Screwdriver

$4.95

BOSCH

1581VS $144 VS Orbital Jigsaw

3283DVSK	RO Sander Kit$	117
B4050	New! Inline Jig Saw	113
11212VSR	SDS Hammer drill	212
1347A	Mini Grinder	99
3310K	NEW Cordless	193

BLACK&DECKER

2872K2 *with 2 batteries* **12V $188**

2874K 14.4V $208

1180	1/2" Drill	118
2037	Drywall Screwgun	94
2037W	Drywall gun w/50ft cord	119
2038	HD Screwgun	94
2660	Drywall Screwgun	86
2670	1/2" Impact Wrench	149
2721	1.5hp Router 1/2" collet	148
3105	Reciprocating Saw	148
3339	3hp VS Plunge Router	268
4075	7" Wildcat Grinder	165

DELTA

37-070 $247 6" Table Top Jointer

14-650	Hollow Morise Chisler	285
17-960	Oss.Sander Kit	83
22-540	12" planer	384
28-180	10" band saw	156
31-080	1" Belt 5" Disc Sander	88
31-340	1" Belt 8" Disc Sander	203
31-460	4" Belt 6" Disc Sander	126
32-100	Plate Joiner	254
36-040	8" Compound Miter	149
36-090	Sidekick 10" MiterSaw	218
36-210	10" Compound Miter	248
36-250	NEW Compound Slide Saw with stand	558
40-150	15" Scroll Saw	115
40-560	16" Scroll Saw	177
40-640	20" Scroll Saw	298
35-617	10"x50T Carbide Blade	34
35-677	14"x108T Carbide Blad	75

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Grit	10 yards 4 1/2" roll	pieces	DISCS 6" round	5" round
60	N/A	100 pc	12.95	11.95
80	9.95	100 pc	11.95	10.95
100	8.85	100 pc	10.95	9.95
120	8.85	100 pc	10.95	9.95
150	8.85	100 pc	10.95	9.95
180	8.85	100 pc	10.95	9.95
220	8.85	100 pc	10.95	9.95

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Kit w/case & paper $188
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2467	48" w/ hand hole	49
2468	72" w/ hand hole	104

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DP80	8" Drill Press	99
DS1000	Detail Sander	39
DC500	Detail Carver	62
J60VK	JigSaw Kit	85
TRMK2	Trimmer w/ 2 bases	99
RJ100VK	Reciprosaw	99
RS115K	RO Sander Kit	69
SC162	Scroll Saw	119
SC162VS	VS Scroll Saw	165
TS254	10" Miter Saw	197

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626SK	1/4" Crown 1" StaplerKit	104
8290	6d-16dFrming Nailer	314

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Circle No. 2

New Technology Improves Sleep Quality

Chances are, you need better sleep. Thanks to advances in sleep surface technology, now you can get it!

America has become a nation of the chronically sleep-deprived. The Better Sleep Council reports that over the past 20 years, we Americans have added around 158 hours, or nearly an entire month each year, to our job schedules. That's not to mention the time we spend working hard to care for our families and homes. Sleep deprivation is caused by both lack of time spent sleeping and poor quality sleep. Sound familiar? Then you owe it to yourself to read on!

SLEEP DEPRIVATION CAN BE DANGEROUS

According to the AAA Foundation for Traffic Safety, sleep-deprived drivers are vulnerable to "micro-naps" lasting four or five seconds – plenty of time at highway speeds for a fatal crash to occur. Disrupted sleep and sleep disorders cost American businesses billions of dollars annually in lost productivity, industrial accidents and higher medical bills. Lack of sleep also was implicated in the Exxon Valdez oil spill, the space shuttle Challenger disaster and the nuclear accident at Three Mile Island.

Loss of sleep during the night is responsible for increased vulnerability to illness, a tendency to nod off at work the next day, and even loss of creativity and clarity of thinking, say British researchers. Power tools can become dangerous weapons in the hands of someone who is not well rested. And almost everyone is familiar with the physical aches and pains that occur because of poor quality sleep.

DO YOU NEED MORE SLEEP, OR JUST BETTER SLEEP?

On the average, most adults require seven and a half to eight hours of sleep per night, and a full cycle including *deep* sleep is required for us to feel adequately rested in the morning. Any number of factors can interfere with deep, nourishing sleep – including cigarette smoking, worry, a noisy environment and physical discomfort.

Air-cushioned support has been proven to positively affect all three factors that determine the quality of sleep: spinal alignment, pressure points and physiology.

We try remedies from pain medication and sleeping pills, to chiropractic care and self-relaxation techniques in order to get better sleep and rid ourselves of morning aches and pains. But new sleep surface technology offers a simpler solution for many people who toss and turn.

THE FIRST REAL BREAKTHROUGH IN SLEEP SURFACE TECHNOLOGY IN OVER 100 YEARS

Even if you just bought a new bed, you may be sleeping on an antiquated surface! Developed a century ago, innerspring mattresses can create pressure points that interfere with total relaxation. Waterbeds made a big splash in the '60s, but even those labeled "firm" can produce a hammock effect, which can cause the spine to curve unnaturally. Fortunately, a new technology has come through test after test with flying colors: Select Comfort Air Sleep Systems™.

The Select Comfort adjustable firmness mattress uses air which distributes body weight more evenly and provides better support.

While it looks like a traditional mattress on the outside and even fits standard sheet sizes, the Select Comfort mattress is completely unique on the inside. Air is captured inside innovative "I-beam" chambers that contour to the body, provide proper spinal support, reduce pressure points and evenly distribute weight for better sleep.

What's more, each side of the Select Comfort adjustable firmness mattress is independently adjustable – with a remote hand control that digitally tells you the firmness level that's perfect for you. And, you can let air in or out to change the mattress firmness, depending upon how your body feels each night. This is essential for couples, because two people of different shapes and sizes cannot sleep on the same surface and both be as comfortable as they should be to achieve the best possible sleep.

MADE-IN-MINNESOTA QUALITY

Select Comfort adjustable firmness mattresses are manufactured in Minneapolis, Minnesota, and tested for comfort and durability by independent laboratories. Well on its way to becoming a worldwide leader in state-of-the-art sleep systems, Select Comfort currently is the fastest growing company in America's bedding industry, and has earned 22 U.S. patents.

LIGHTWEIGHT AND EASY TO SET UP YOURSELF

The Select Comfort adjustable firmness mattress is so lightweight, it can be delivered via UPS in one carton. Following the simple instructions, one person can set up the system at home, usually in 30 minutes or less. An attached electronic air pump fills the mattress with the right amount of air, and then hides out of sight under the bed. Dual controls allow each sleeping partner to adjust the sleep surface to their desired firmness.

TRY SELECT COMFORT AT NO RISK FOR 90 NIGHTS

Thousands of people from coast to coast already own a Select Comfort adjustable firmness mattress. You can try one, too, protected by a "No-Risk 90 Night" guarantee and up to a 20-year limited product warranty. Call our sleep consultants and ask them about your particular sleep needs. They can answer all your questions and help you better understand how you can benefit from a Select Comfort adjustable firmness mattress.

For a free brochure and introductory video, call 1-800-831-1211, Ext. 4841.

Get The Best Night's Sleep Ever!

Frustrated With The Quality Of Your Sleep?

Do you toss and turn at night? Can't seem to find a comfortable position? Does your back ache when you awake? These are signs that your metal coil mattress or waterbed isn't supporting you properly and isn't right for your body. Select Comfort can help you sleep better with a revolutionary mattress that's so comfortable and supportive, it's recommended by the many doctors who use our product.

With Select Comfort, you each get exactly the firmness you need.

Select Comfort provides proper back support and contours to your body. Weight is more evenly distributed and pressure points are reduced.

Metal coil mattresses can create pressure points and provide uneven support.

You Control The Firmness

With Select Comfort, you can change the firmness depending on how your body feels each night. Go from extra-firm to extra-soft, simply at the touch of a button. In fact, the firmness adjusts independently on each side of the bed so you and your partner can get custom support without compromising comfort or quality of sleep.

Customize the firmness of each side of the mattress.

Sleep Better On Air

A Select Comfort adjustable firmness mattress doesn't rely on springs or water. Instead, it supports your body on a cushion of air. Air is better because it gently contours to your body's shape and keeps your spine in its natural alignment. And that lowers the tension in the surrounding muscles. So you can sleep comfortably in any position and wake feeling great!

Select Comfort contours to your body.

As Heard on Paul Harvey News & Commentary

The Only Mattress with Push Button Firmness Control.

Call For More Information

You owe it to yourself to learn more about this revolutionary way to a better night's sleep.

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SELECT COMFORT™

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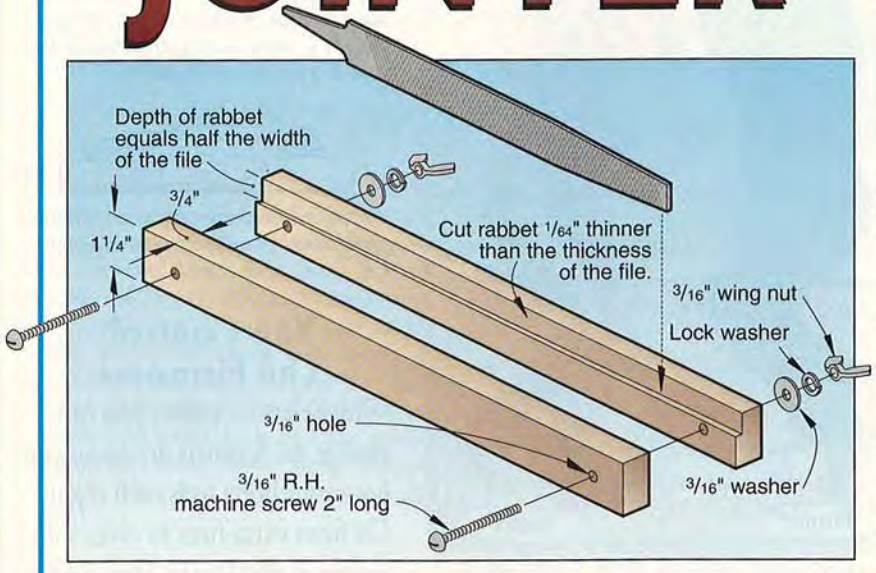
GREAT IDEAS FOR YOUR SHOP

HAND-POWERED LAMINATE "JOINTER"


Depth of rabbet equals half the width of the file
3/4"
1 1/4"
Cut rabbet 1/64" thinner than the thickness of the file.
3/16" wing nut
Lock washer
3/16" hole
3/16" R.H. machine screw 2" long
3/16" washer

Clamp a double-cut flat file into our handy laminate jointer, and you can clean and straighten rough laminate edges so they will meet neatly at a seam. You also can smooth and straighten the cut edges of sheet metal with this easy-to-make device.

To start, size the length of the laminate jointer a couple inches longer than your file. Then, cut the rabbet (but in only one side of the holder). To ensure a tight fit, cut the rabbet about 1/64" thinner than the thickness of the file. Drill the holes, assemble with the hardware shown, and put your jointer to work.

Project Design: Chuck Hedlund
Photograph: King Au
Illustration: Roxanne LeMoine

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Have you ever dreamed of converting your workshop into a money making machine? With RBI tools, your dream can become reality! Using your RBI Hawk Ultra Precision Scroll Saw, you can turn scrap pieces of wood into profitable craft items. Another possibility is to use your new Universal Woodplaner to take sawmill cut lumber and turn it into valuable finished stock or expensive hardwood moldings.

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The American Tool Manufacturer

Our Hawk 220VS Scroll Saw was picked for **WOOD** magazines - ***New, Improved Workshop***
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Our RBI 812 Planer was rated ★★★★★ for overall performance!
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Free opportunity kits tell you how to earn good money in these expanding fields

Ever dream of being the boss...in charge of your own profitable business? You can turn those dreams into cold, hard cash — if you get into a growing field where service is in constant demand.

Foley-Belsaw's unique in-home training programs let you gain skills in different career fields where the demand is growing and will continue to grow through the twenty–first century.

You learn highly profitable skills at home, at your own pace from Foley-Belsaw, world leaders in training since 1926.

There's no better time, no easier way, to start your own money–making full or part–time business. And there's no obligation or cost involved in learning the easy steps you can take to make your new career a reality!

1 Locksmithing. As millions of Americans demand greater protection, this becomes a high demand field. We provide the training to make you a professional locksmith who commands $25 per hour.

2 Small Engine Service & Repair. There are more than 65 million small engines in use today (a number growing at a rate of 1,000,000 each month). You can make $45 in just 1/2 hour for a simple tune–up, and even more for many of the simple repairs you'll learn on everything from snow blowers to bass boats.

3 Professional Saw & Tool Sharpening. Imagine a business where 90 cents out of every dollar you take in is cash profit! You'll earn $18 to $25 per hour running machines that do the work for you.

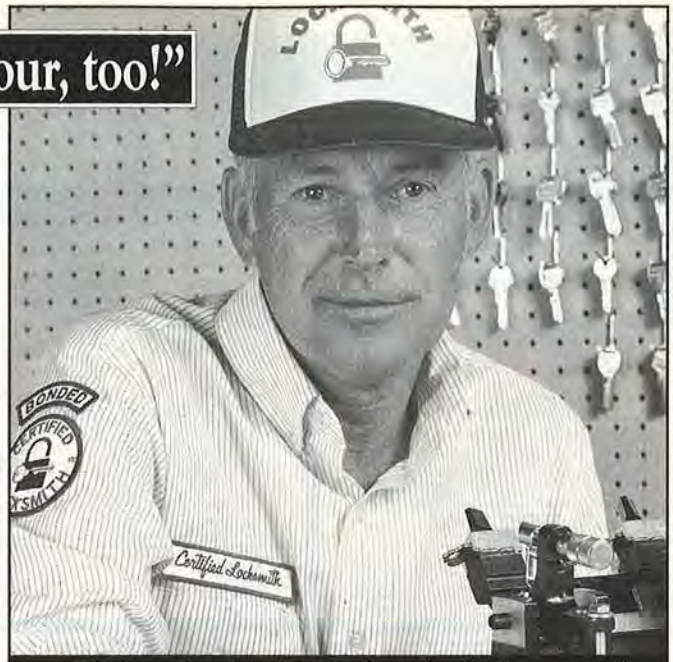
4 VCR Cleaning, Maintenance & Repair. The VCR has become a basic part of nearly every American household. You can make up to $50 per hour in this fast growing field.

5 Computer Repair, Maintenance & Upgrade. There's no doubt about it, the computerization of America is taking place! Get a jump on a high paying occupation or business of your own in a field with an unlimited future.

6 TV & Satellite Dish Repair. You see them popping up in yards all over town. The demand is growing for the variety in entertainment only a satellite dish can provide. Get the skills you'll need to profit in this growing field.

7 Professional Gunsmithing. Skilled gunsmiths — when you can find one — charge up to $50 per hour for simple repairs. That's money you can put in your pocket with the training you'll get from Foley-Belsaw.

8 Professional Woodworking. Build over $3,000 worth of valuable furniture while you learn! You'll start the Foley-Belsaw course with the simplest of projects then move on to creating heirloom–quality furniture! You'll save thousands on your own home repairs alone.



"I chose Locksmithing, but that's just one of many fast-growing fields in need of skilled professionals. And with Foley-Belsaw, you train at home in your spare time while earning money from the start."

Bill Smith

9 Upholstery. As furniture prices rise and quality noticeably decreases, it makes good sense to pursue a career in upholstery. You'll learn to make big profits in both commercial and consumer markets.

10 Computer Programming. It's a fact: Computers are more widespread than ever before. And programmers with the right skills command top dollar for their work. Learn the languages most in demand — Q Basic, C, C+ and C++ — and watch your income soar.

11 Vinyl Repair. A fascinating business that will lead you to a profitable career repairing vinyl and similar materials.

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Your free opportunity kit will be rushed to you!

If coupon is missing, write to: Foley-Belsaw Company, 6301 Equitable Road, Kansas City, MO 64120

Call or complete & return this coupon to: Foley-Belsaw Institute, 6301 Equitable Road, Kansas City, MO 64120

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- ❑ Saw & Tool Sharpening, Dept. 21573
- ❑ VCR Repair, Dept. 62433
- ❑ Computer Repair, Dept. 64330
- ❑ TV/Satellite Dish Repair, Dept. 31206
- ❑ Gunsmithing, Dept. 92236
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Since 1926

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HARBOR FREIGHT TOOLS

CENTRAL MACHINERY

5 SPEED BENCH DRILL PRESS

1/3 HP MOTOR

- 2" stroke, 8-1/4" swing
- 1/2" chuck

ITEM 05901-7VNA

$49.95 FREE SHIPPING

25 PC. BRAD POINT WOOD BIT SET

- Sizes: 1/8" through 1/2" by 64ths

ITEM 03376-6VNA $8.95 FREE SHIPPING

CHICAGO Electric Power Tools

3-1/4" PLANER

- Front base has a V-groove to help guide in chamfering
- 2 blade cutter
- Includes rabbeting guide plate/fence, sharpening holder, blade setting jig, spare brushes, and replacement belt
- D-handle with lock-on button
- 1/10" maximum depth of cut
- 110V, 5 amps, 17,000 RPM
- 34,000 cuts per minute
- 6-1/4 lbs. tool weight

FREE SHIPPING

ITEM 32222-3VNA $39.99 FREE SHIPPING

2 PC. REPLACEMENT BLADES

ITEM 33262-2VNA $7.95

CONTROLLED PRESSURE NON-MARRING HARDWOOD CLAMPS

FREE SHIPPING

JAW LENGTH	OPEN-JAW CAP.	ITEM	PRICE
6"	3"	06986-4VNA	★$2.95
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DRILL MASTER

TiN COATED FORSTNER BIT SETS

Includes 3/8" cut down shanks and individually organized wooden case. Rockwell hardness range from 55-65HRC. 20

16 PC. SET

- 16 sizes 1/4" to 2-1/8" by eighths

ITEM 32404-8VNA $29.99 FREE SHIPPING

20 PC. SET

- 20 Sizes from 1/4" to 3/4" by 16ths, 7/8", 15/16", 1" to 2" by eighths

ITEM 31130-7VNA $34.99 FREE SHIPPING

CENTRAL MACHINERY

10" PLANER

LIMIT 1

- 2 HP, 110V, 1 phase, 11 amp, 8000 RPM
- 19" x 16-5/8" x 16" overall dimensions
- 5-1/8" working distance
- 10-1/8" x 9-1/8" feed table
- 2-blade cutter head
- 10-1/8" blade size
- Stand sold separately

BLOW OUT PRICE!

ITEM 32377-3VNA $199.99 FREE SHIPPING

BUY NOW & SAVE!

12-1/2" ROLLER AND BRACKET SET

Double your table saw capacity! Make your own roller table.

ITEM 30026-8VNA $4.95 FREE SHIPPING

Pittsburgh

Pittsburgh LIFETIME WARRANTY

LIMIT 2

2 PC. 3/4" HEAVY DUTY PIPE CLAMP SET

Pipe not included.

- Handle screw operating range: 2-1/8" • Weight: 2-7/16 lbs.
- 1-1/2" throat depth

FREE SHIPPING

ITEM 31255-4VNA $2.99

SKIL HD HEAVY DUTY TOP GUN II™

Skil HD2736:02X

INCLUDES FREE 13 PC. DRILL BIT SET

LIMITED QUANTITIES

12V, 3/8" DRIVER/DRILL WITH KEYLESS CHUCK

- Includes TWO batteries
- Two speed ranges: 0-500 and 0-1650 RPM
- 5 torque settings • 4 lbs. tool weight
- 1 hour recharging time

ITEM 32559-1VNA $129.95 FREE SHIPPING

CENTRAL MACHINERY

MORTISING MACHINE

Make a square hole in the fraction of the time it takes by hand!

- Includes 1/4", 3/8", and 1/2" chisels
- 5" maximum work piece height
- 3-1/2" swing
- 1/2 HP, 110V, 2.3 amps

FREE SHIPPING

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Pittsburgh

Pittsburgh LIFETIME WARRANTY

10 PC. SPRING CLAMP SET

Made of nickel-plated, heavy gauge steel, with heavy duty tempered springs and comfortable vinyl coated handles.

- Contains four 1" capacity clamps, four 2" capacity clamps, & two 3" capacity clamps

FREE SHIPPING

ITEM 05968-2VNA $7.99

CENTRAL MACHINERY

LIMIT 1

1" x 30" BELT SANDER

Remove the belt back plate and sand all types of curves and odd shapes.

- Motor: 1/4 HP, 2 amp, 60 Hz, 120V, 3450 RPM • Table: 5" x 5"
- Shipping weight: 19 lbs.

FREE SHIPPING

ITEM 07830-5VNA $39.99

SCOTCH BRITE™ 1" x 30" MEDIUM GRIT BELT

- For surface finishing
- Incredibly durable

FREE SHIPPING

ITEM 32816-1VNA $5.95

CENTRAL MACHINERY

LIMIT 1

FREE ACCESSORIES: Stand, 6" belt, 9" disc, open-end wrench, hex key wrench

COMBINATION 6" BELT & 9" DISC SANDER

1 HP, 110V, 8 amps, 3450 RPM, all ball bearing motor; overall height: 40"; table tilt 0° to 50°; table surface: 6-1/2" x 12-3/4"; two position work table for disc or belt use; disc speed: 1720 RPM; belt: 6" W x 48" L; belt speed: 1280 FPM; wt: 121 lbs.

FREE SHIPPING ON THIS ITEM

ITEM 06852-5VNA $149.99

LIMITED QUANTITIES

STANLEY

STANLEY INTERLOCK KNIFE

This knife is designed with a contoured sure grip handle to prevent injuries. Blade extends from fully covered to stops at one quarter, half and fully extended. Spare blades are stored in the handle.

ITEM 04783-4VNA $1.99 FREE SHIPPING

CENTRAL MACHINERY

10", 2HP BENCH TABLE SAW

- Max. depth of cut @ 90°: 3"; @ 45°: 2-1/2"
- Motor: 2 HP, 115V, 60 Hz, 13 amp, 4500 RPM
- Blade sold separately
- Shipping weight: 40 lbs.

FREE SHIPPING

ITEM 32648-3VNA $79.99

10" SAW BLADE

- 40 tooth carbide tips
- 5/8" arbor

FREE SHIPPING

ITEM 00529-6VNA $9.95

Pittsburgh

Pittsburgh LIFETIME WARRANTY

BAR CLAMPS

Multiple clutch plates permit instant adjustment. All clamps have 3/4" pads & throat depth of 2-3/4".

★ FREE SHIPPING

LENGTH	ITEM	PRICE
6"	05974-5VNA	★$3.29
12"	05975-0VNA	★$3.99
24"	05976-1VNA	★$4.99
36"	05977-0VNA	★$5.99

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WE'LL BEAT ANY COMPETITOR'S PRICE ON ANY IDENTICAL ITEM - EVEN IF IT'S AN ADVERTISED SPECIAL

Pittsburgh

LIFETIME WARRANTY

6 PC. HEAVY DUTY
PLIER SET

Drop forged from rugged alloy steel, precision machined, heat-treated, & highly polished for long life. Includes 6" all-purpose diagonal cutters, 7" heavy duty diagonal cutters include tapered jaws, 8" needle nose pliers features extra strong grip, 8" lineman's pliers has hardened cutting edges and jaw separation, 10" slip joint pliers includes a shear wire cutter, and 10" groove joint pliers.

ITEM 00532-6VNA ~~$19.99~~ $9.95 FREE SHIPPING

CENTRAL MACHINERY

12" PLANER

Put a professional finish to low cost raw lumber quickly. Powerful smooth drive system gives cool, even planing and constant blade speed.

- Motor: 2 HP, 115V, 60 Hz
- Single wheel depth adjusts: 0" to 6"
- Maximum planing capacity: 3/32" FREE SHIPPING
- Maximum width: 12"

ITEM 06469-7VNA $299.99

CENTRAL MACHINERY

13 GALLON INDUSTRIAL PORTABLE
DUST COLLECTOR

Develops over ten times the suction of most shop vacuums. 4" hose is sized to pick up large chips from jointers, saws, shapers and planers. Unit has heavy duty ball bearing castors. Hose is sold separately.

Bag capacity: 13 gallon; Motor: 110V, 7 amp, 1 HP; Hose inlet: 1; CFM: 660; Shipping weight: 56 lbs. FREE SHIPPING

ITEM 31810-4VNA $119.95

CENTRAL MACHINERY

12" X 37"
WOOD TURNING LATHE

Index pin contains 36 - 10° spacings for accurate fluting and marking on workpieces. Accessories include: left and right turning face plates and 6" and 12" tool rests. (Base sold separately)

Distance between centers: 37"; Swing over bed: 12"; Spindle speeds: 575, 980, 1560, 2520 and 3580 RPM; Motor: 1/2 HP, 1725 RPM, 115V, 60 Hz AC, swing mounted to headstock; Drive spindle: No. 1 Morse taper plus 3/4-16 threaded; Tailstock: No. 1 Morse taper 2-3/8" ram travel; Ship. wt.: 80 lbs.

ITEM 06841-0VNA $139.99 FREE SHIPPING ANYWHERE

WOOD LATHE STAND

(Wood table top not included.)

ITEM 06842-1VNA $59.99 FREE SHIPPING

2 HP, 1050 PSI, 1.75 GPM, ELECTRIC
PACIFIC HYDROSTAR
PRESSURE WASHER

This washer delivers 1050 PSI, but its turbo rotary nozzle boosts your cleaning power up to 1400 PSI! Excellent for standard and heavy duty cleaning jobs, degreasing, sandblasting, and paint removing. Includes lance, turbo lance, foaming lance, 12 oz. detergent nozzle, gun with safety trigger, 39 ft. cord with ground fault current interrupt, and 19-3/4 ft. hose.

- 115V, 15 amps
- 31-1/2 lbs. ship. wt.

ITEM 33594-4VNA $159.50 FREE SHIPPING

CANVAS TOOL BAG

Handy 15" size. Made with heavy duty canvas and hard bottom. Features heavy duty zippered top with two internal pockets and one external pocket with a snap down flap.

- 15" x 6" x 8-1/2"

ITEM 32282-1VNA $5.99 FREE SHIPPING

LIMIT 1

Porter Cable 9444

PROFILE SANDER KIT

Sand corners, curves, angles, and an entire roll top desk. Flutes, decorative picture frames, grooves, score lines, shutter slats.

- 1.8 amps @ 120V
- 6000 SPM

Includes dust pick-up pad (for hook & loop paper), dust wand, regular and offset sanding profile mounting attachments, six each of convex and concave radius profiles, five degree angle profiles, and an assortment of sandpaper all packed in a blowmold case

ITEM 33757-3VNA $112.95 FREE SHIPPING

BOSCH
Bosch 1587VS

VARIABLE SPEED TOP-HANDLE JIGSAW

LIMIT 1

- Foot plate tilts to 45°
- 5 amp, 120V motor
- 1" stroke length
- 5-1/2 lbs. net weight

FREE SHIPPING

ITEM 31591-8VNA $142.95

STANLEY
Stanley 33-430

POWERLOCK® TAPE MEASURES

- 25 ft., 1" blade remains rigid for 7 ft.
- Chrome-plated case with belt hook
- Yellow Mylar® coated steel blade with Tru-zero hook

ITEM 00906-4VNA $9.95 FREE SHIPPING

CENTRAL PNEUMATIC CONTRACTOR SERIES

LIMIT 1

18 AND 19 GAUGE
AIR FINISH NAILER

Easy to use in tight spots. With a loading capacity of 105-18 gauge brads.

- Air consumption: 3.5 CFM at 75 PSI
- Uses 18 and 19 gauge brads
- Similar to Senco LS4
- 1/4" NPT inlet

FREE SHIPPING

ITEM 32870-2VNA $42.93

CENTRAL MACHINERY

LIMITED SUPPLIES!

PROFESSIONAL 4" BELT/6" DISC SANDER

Die cast aluminum table for disc or belt sander bevels to 45°. Versatile sander handles wood, plastic, aluminum, and steel.

- 1/3 HP, 120V • Belt: 4" x 36"; disc: 6"
- Speeds: belt 1952 ft./min.; disc 3450 RPM
- Ship. wt.: 47 lbs.
- Belt table tilts 0° to 90°
- Work table: 5" x 7-1/2"

FREE SHIPPING

ITEM 05908-8VNA $79.99

15 PC. TUNGSTEN CARBIDE TIPPED ROUTER BIT SET

This is the set all serious woodworkers need. Ground to ultra close tolerances for the best finish available. Includes individually organized wood storage case. • 1/4" shanks

Includes:1-1/4" rabbeting♦, 1-3/8" cove♦, 1-1/16" roman ogee♦, 1-1/4" rounding over♦, 1/2" flush trimming♦, 1-3/16" 45° chamfer♦, 1/2" dovetail, 3/4" straight,1/2" straight, 3/8" V-groove, 1/4" combination panel, 1/4" straight, 1/2" mortising, 1/4" self-piloting flush trim, 3/16" self-piloting 7° bevel trim.

♦ Includes pilot bearing

~~$69.99~~ ITEM 31164-7VNA $45.99 FREE SHIPPING

LIMIT 1

CHICAGO Electric Power Tools

HEAVY DUTY 4-1/2"
DISC GRINDER

- High power to weight ratio
- 5/8"-11 spindle with 7/8" arbor adapter
- High powered 10,000 RPM
- Motor: 3/4 HP, 110V, 5.18 amps
- 11-7/8" long

FREE SHIPPING

ITEM 31135-1VNA $27.95

STANLEY BOSTITCH

LIMITED QUANTITIES

19 GAUGE PNEUMATIC
BRAD NAILER

Stanley Bostitch T29-30

- 19 gauge
- 1/4" NPT air inlet
- 60 to 100 PSI range

ITEM 50082-9VNA $99.99 FREE SHIPPING

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QUICK GRIP® MINI BAR CLAMPS

Compact size and one hand operation make this clamp unbeatable in cramped areas. The harder you squeeze, the tighter the grip, with up to 150 lbs. of pressure. Soft pliable pads protect fine finishes. Convenient trigger releases clamp at the touch of a finger.

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BEVEL BASICS AND BEYOND

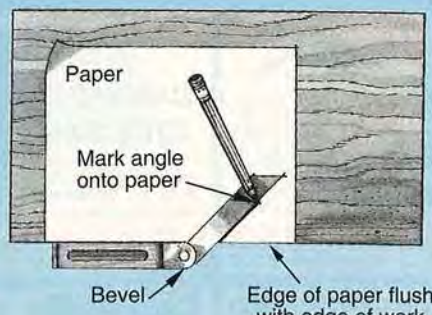
Woodworkers have used bevels for centuries, and with good reason. This simple hand tool transfers and duplicates angles with dead-on precision. In this article, we'll show you how to set the bevel for angles taken off workpieces, full-sized plans, and written instructions.

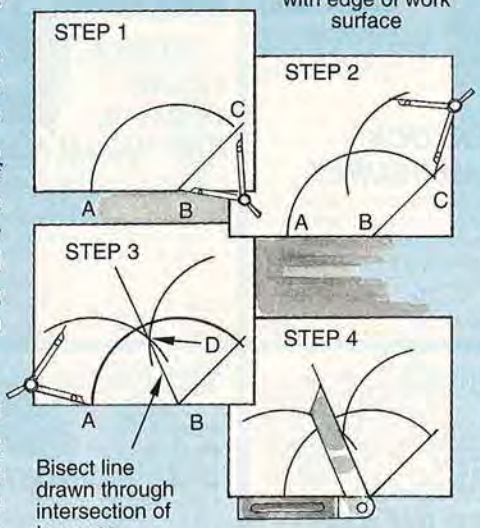
How a bevel helps you install trim

If all wall, tabletop, and cabinet corners measured exactly 90°, installing trim moldings would be a snap. You would simply set your saw for a 45° angle and start cutting. Of course, few corners meet this description. Fortunately, with a bevel you can duplicate any angle and transfer it to a sheet of paper. Then, with a few simple procedures you can cut matching mitered trim pieces. Here's how.

First, you need to "bisect" the angle, meaning that you divide the angle into two equal angles. To do this, loosen the bevel's wing nut, lay the body along one edge of the corner, and position the blade along the other edge of the corner as shown *below*. When the bevel hugs the edges, tighten the wing nut. (You can do the same on inside corners, too.)

Now, align the edge of a sheet of paper with the straightedge of a work surface, and transfer the bevel's angle to the paper as shown *above*. (You can mark the line using either side of the bevel's blade.) Then, bisect this angle with a compass as in the 4-step drawing *left*. Here's an explanation of each step:



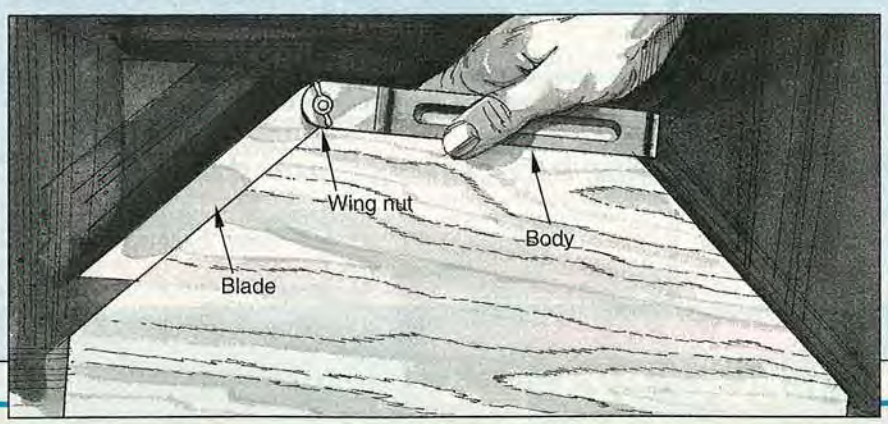


1 Place the point of a compass at the bottom of the marked line (point B), and create points A and C by swinging an arc of any radius between 3" and 5". Use a sharp lead for the best accuracy.

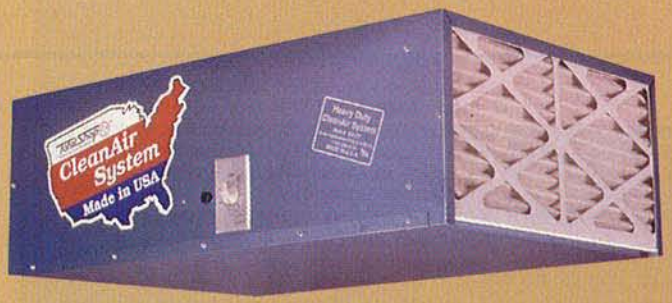
2 With the radius of the compass unchanged, place the point at C and swing another arc.

3 Move the point of the compass to point A and swing an arc just as you did in Step 2. The intersection of these two arcs creates point D. With a straightedge, draw a line from point B through point D to create the bisect line.

4 Adjust your bevel according to the angle between the work-surface edge and the bisect line. To cut a tight-fitting miter, adjust your saw according to the bevel's angle as shown *above*.



Continued on page 32



Fact #1 Total Shop's *CleanAir System* is the only air filtration system with an air tight fan box. We caulk our filters in place for a totally air tight seal. No dust can slip by the filters creating a fire hazard in the motor. On other units, a potential fire hazard does exist.

Fact #2 With the Total Shop *CleanAir System* you will spend less time changing filters. Our 15" thick filter has been proven to last in hobby shops for an average of 12 - 14 months. Considering filter size, the JDS Air Tech 2000 unit would last only 6 - 7 months with their 8" filter and the Hartville Tool unit would last only 3 months between filter changes with their 4" filter.

Fact #3 The Total Shop *CleanAir System* is the only filter unit in this price range that has been UL Tested and Approved. Our main filter is the only filter approved and labeled by ASHRAE as 95% effective on wood dust. A recent magazine article featured the JDS unit and revealed the Air Tech 2000 has only 65% efficient filters.

Fact #4 Total Shop's *CleanAir Systems* have been made in Greenville, SC for almost 9 years. No competitor has been advertised for more than 2 1/2 years.

Fact #5 The Total Shop *CleanAir System* is the only filtration unit that includes a lifetime warranty. Any defect in workmanship will be repaired FREE for as long as you own the unit. No competitor currently offers this!

Fact #6 Experience and customer satisfaction are #1 at Total Shop. All competitors combined have less units in use than Total Shop. We are so sure of our *CleanAir System* that we give you a 30 day trial period. If you aren't satisfied just send it back for a refund.

CleanAir System
260 CFM order #90175
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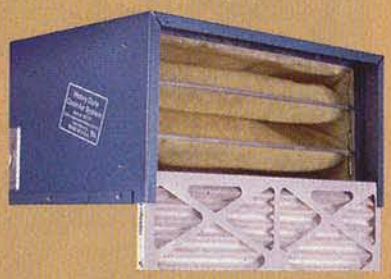
And here are just a few more advantages the *CleanAir System* has over the competition...

- Needs no outside venting
- Available for any size shop
- Very quiet operation
- Has no effect on existing room temperature
- Runs on standard house current
- Compact size fits almost anywhere
- Heavy gauge steel cabinet w/ mounting holes



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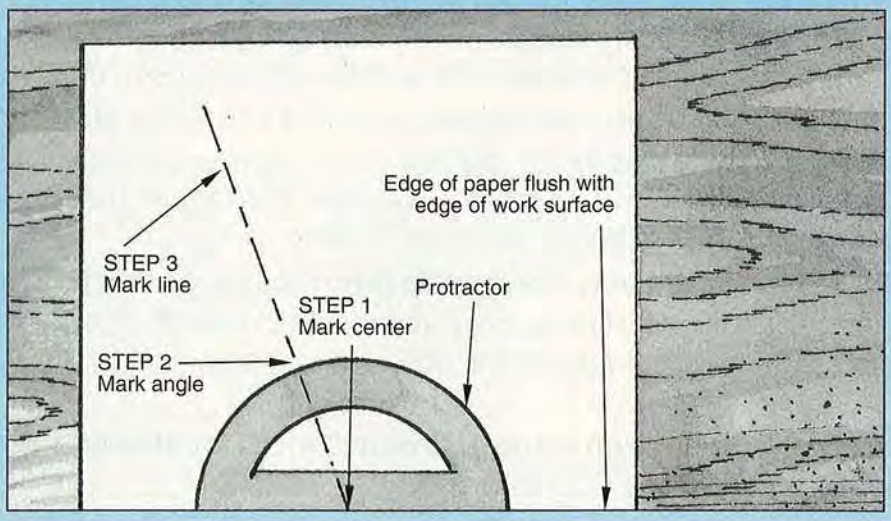
Continued from page 30

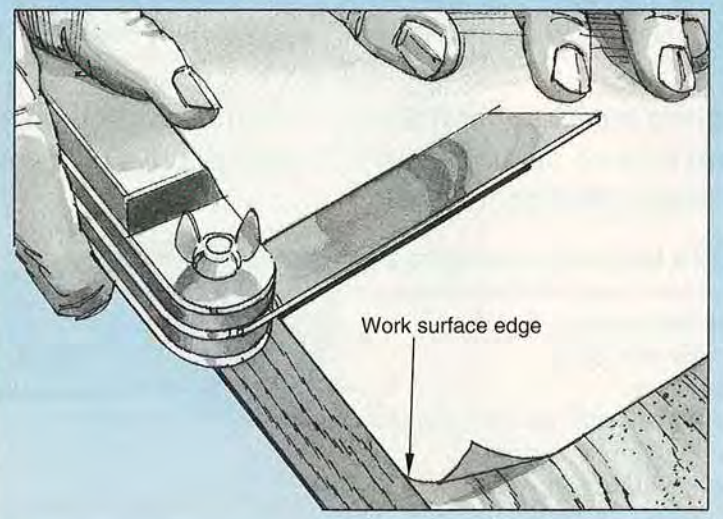
How to duplicate cutting angles specified in written instructions

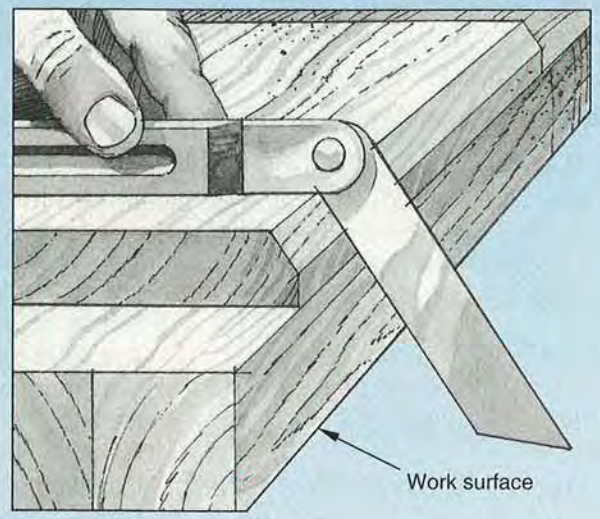
When a plan asks for a beveled or angled cut, or angled hole, you can use an inexpensive protractor and bevel for precise results. First, using a protractor, lay out the angle along the edge of a worksheet as shown *below*. Then, position the body of the bevel along the edge of the work surface, and set its angle according to the layout line you just drew as shown *middle left*.



The first few times you try this, it makes sense to double-check the accuracy of your setting by repeating the procedure. This shouldn't take more than a few seconds. Now, use the bevel to set the miter gauge, fence, or table of your tablesaw, radial-arm saw, jointer, drill press, bandsaw disc sander, or other shop tool.

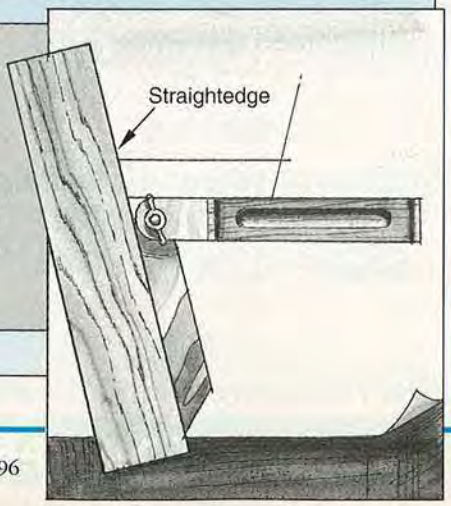
If a plan calls for a chamfered edge, and you prefer to do the job with a bench plane, then a bevel can help you in this instance, too. After adjusting your bevel for the necessary angle as described in the *previous* paragraph, use the bevel to periodically check your work as shown *below*.





Duplicating angles from full-size drawings

To accomplish this task, lay a straightedge, such as a jointed board, along one side of the angle. Then, place the blade of the bevel against the straightedge, and align the body with the other side of the angle as shown *right*. This method works more accurately than positioning the bevel above the pattern and eyeballing its alignment without the aid of a straightedge.



10% to 20% OFF WINTER COMBO SALE

Sale prices good thru 1/31/96.

FREE $45 IN SHARPENING COUPONS

GOOD ON ALL FORREST OR *OTHER MAKES* OF CARBIDE BLADES OR DADO SETS. Coupons expire 12/31/97.

Must mention *WOOD* magazine for discounts, coupons & bonus with purchase.

BUY 1 BLADE OR DADO AT **10% OFF** SALE PRICE, OR BUY 2ND BLADE AT **20% OFF** (EQUAL OR LESSER VALUE) **15% OFF** DADO AS SECOND CHOICE.

CHOPMASTER FOR SLIDING COMPOUNDS & MITER SAWS

New specs, 5° Neg. Pts. & flat, runs out less than .002 for perfect, tight, smooth, splinter-free miter joints. **TAKE EXTRA 10% – 20% OFF COMBO SALE!**

NEW SIZES AVAILABLE

	LIST	SALE
Delta Sidekick 6-1/2"x40Tx5/8"	$149	$ 89
Sears 8-1/4" & Delta 8-1/4"x60Tx5/8"	$170	$ 99
Hitachi 8-1/2"x60Tx5/8"	$179	$109
DeWalt 8-1/2" & Ryobi 8-1/2"x60Tx5/8"	$179	$109
Delta 9"x80Tx5/8"	$204	$119
Ryobi–Makita & all 10"x80Tx5/8"	$207	$129
DeWalt, Makita, B&D, Hitachi 12"x80Tx1"	$229	$139
Ryobi–Makita 14"x100Tx1"	$266	$179
Hitachi 15"x100Tx1"	$277	$189

For good general purpose cuts use Woodworker II 30T & 40T or Woodworker I. Use small stiffener where possible.

WOODWORKER II

With this one ALL PURPOSE blade you can RIP & CROSSCUT 1"–2" ROCKHARDS and SOFTWOODS resulting in a **SMOOTH AS SANDED** surface. PLY-VENEERS of OAK and BIRCH will crosscut with NO BOTTOM SPLINTER at moderate feed rates.

- DOUBLE HARD and 40% STRONGER C-4 CARBIDE
- Ends blade changing
- Ends scratchy saw cuts
- Ends second-step finishing
- Ends cutting 1/16" oversize to allow for RESURFACING
- **BUY AND SHARPEN 1 BLADE INSTEAD OF 3**

5/8" holes, boring thru 1-1/4" add $7.50. Larger at Time Basis —Shipping $4.50

WOODWORKER II	LIST	SALE	10%	20%
14"X40TX1"	$215	$149	$134	$119
14"X30TX1"	$195	$139	$125	$111
12"X40TX1"	$183	$129	$116	$103
12"X30TX1"	$162	$119	$107	$ 95
10"X40TX1/8" or 3/32"	$156	$119	$107	$ 95
30T 1/8" or 3/32"	$135	$ 99	$ 89	$ 79
9"X40T	$146	$109	$ 98	$ 87
30T	$125	$ 99	$ 89	$ 79
*8-1/4"X40TX 3/32"	$136	$ 99	$ 89	$ 79
8"X40T 3/32"	$136	$ 99	$ 89	$ 79
30T	$115	$ 89	$ 80	$ 71
7-1/4"X30T 3/32"	$112	$ 69	$ 62	$ 55
**6"x40T 3/32"	$136	$ 89	$ 80	$ 71

*NEW for Sears & Makita Table Saws **New For Saw Boss

WOODWORKER I – For TABLE and RADIAL SAW

This trim and crosscut ALL PURPOSE blade gives scratch-free polished cuts on all materials RIP or CROSSCUT UP TO 2".

- ALL 60T AND 3/32" THIN KERF 30° ATB and 5° face hook on 10" diameter and under. 12" and 14" are 20° ATB 1/8"K.
- DOUBLE HARDER and 40% STRONGER carbide.
- THIN KERF. Saves 1/3 wood loss on each cut, radial or table. Feeds easy when used for moderate rip and crosscut on table saw. Reduces "JUMP IN" for better "PULL CONTROL." Practically eliminates bottom splinter on RADIAL CROSSCUT.
- Totally stops ALL bottom and top splinter on ply veneers in push-cut mode on RADIAL.
- Our STIFFENER STRONGLY RECOMMENDED AGAINST outside blade for best cuts. Made and serviced in U.S.A. for your benefit.

	LIST	SALE
14"x60Tx1" 1/8"K	$224	$159
12"x60Tx1" or 5/8" 1/8"K	$198	$139
10"x60Tx5/8" 3/32"K	$162	$129
9"x60Tx5/8" 3/32"K	$156	$119
8"x60Tx5/8" 3/32"K	$150	$109
NEW!		
8-1/4"x60Tx5/8" 3/32"K	$150	$109
7-1/4"x60Tx5/8" 3/32"K	$150	$109

RYOBI RA200
SEARS TS200
MAKITA 500B NBA
HITACHI PSM8
PORTER CABLE 368-1

SPECIAL COMBO SALE EXTRA 10%-20% OFF

THE ONE BLADE THAT LEAVES A SMOOTH-AS-SANDED SURFACE!

BUY OUR BEST SELLER 10" X 40T FOR ONLY $119 PLUS EXTRA 10%–20% OFF FOR COMBO SALE!

RECEIVE WITH EVERY FORREST BLADE OR DADO LISTED, 9 SHARPENING COUPONS WORTH $5.00 EACH!

ONLY **$62 or $50** NET COST TO YOU AFTER USING SHARPENING COUPONS

Outperformed 36 other premium blades, both foreign and domestic! WOOD® Magazine test, Sept. '93, pg. 45

TRY A FORREST CARBIDE BLADE TODAY!

The Proof Is In the Cutting

Both Woodworker II blades performed very well, whether cutting through butter-soft ¾"-thick pine or iron-hard 1¾"-thick ash. The 20° positive hook angle and 15° alternate top bevels give the blades an aggressive attack; we maintained a brisk, uniform feed rate while ripping a variety of woods on the powerful Unisaw and experienced no discernible resistance or slowing. On the smaller saws, switching to the thin-kerf blade allowed very similiar feed rates, again with barely noticeable resistance.

Although we've used blades that cut faster, their cut quality couldn't touch what we got with the Forrest blades. On solid stock, ripped edges came off our saws jointer-finished, smooth and slick with no visible teeth marks—good enough to edge-glue without additional machining. Crosscuts came out crisp and clean with no fuzzing or tiny splintering.

The Bottom Line

Performance of the Woodworker II is impressive enough that you could bolt this versatile, general-purpose blade on your saw and use it for virtually all of your cutting operations.

SHOP TEST, Woodworker's Journal Nov./Dec. '95 pg.78

NEW DELUXE DADO-KING!

C-4 Carbide Tips — 4 on each chipper with special negative face hooks.

	LIST	SALE	10%	15%
6" D. 5/8" Bore NEW	$299	$269	$242	$229
8" D. 5/8" Bore	$321	$289	$260	$245
10" D. 5/8" & 1" Bore	$389	$349	$314	$297
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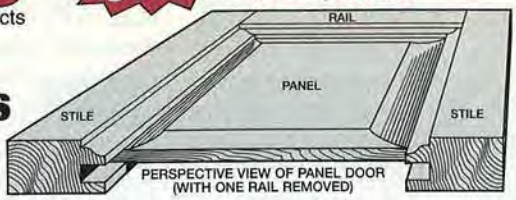

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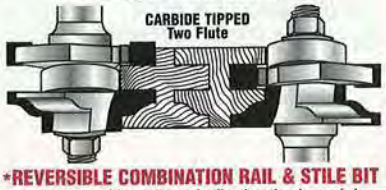

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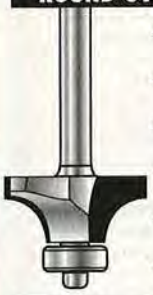
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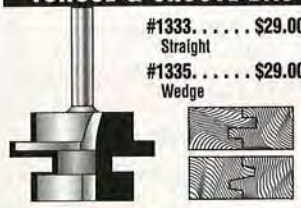
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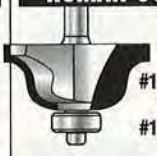
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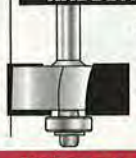
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JANUARY WOOD 1996

LONGLEAF PINE

The South's hardest-working softwood

You probably know longleaf pine best as treated boards and posts for decks and fences, or as dimension lumber for building construction. Yet in the past, longleaf pine played other serious roles, too.

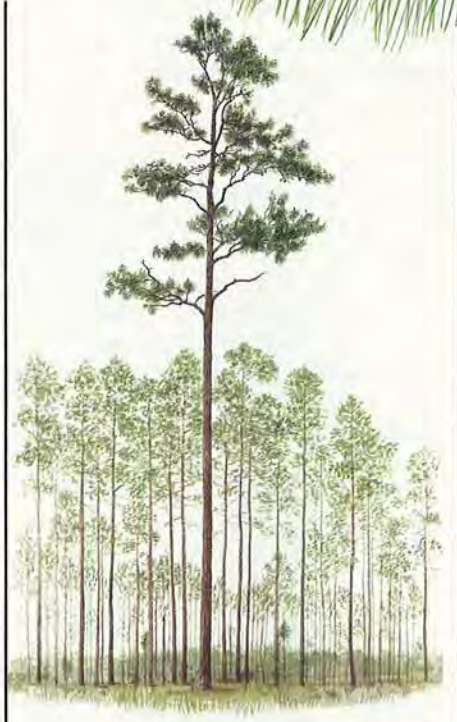
Along with its cousin pitch pine, longleaf pine was an important contributor to the United States' naval stores' industry. The trees' pitch or gum was collected, then distilled into turpentine and resin, which was used in the manufacture of paint, varnish, shoe polish, printing ink, and other products.

Longleaf pine also admirably served as flooring, interior trim, and millwork such as doors and windows in grand homes throughout the Southeast and Deep South. The hard, heavy wood stood up well to abuse and looked great at the same time. Too, because longleaf pine has superior strength for a softwood, it was sawn into large beams and girders for use in bridges, trestles, and other heavy construction.

Today, this once-prominent species of the original southern pine forest has made a comeback. Not only is it a mainstay for the treated-wood and construction industry, but it's finding its way into cabinetry, doors, windows, and other architectural elements.

Wood identification

A part of the southern pine family that includes loblolly, slash, and shortleaf pine, longleaf pine (*Pinus palustris*) grows best in the coastal plain from southern Virginia through the Carolinas into Georgia, Florida, Alabama,



Mississippi, Louisiana, and eastern Texas. The species thrives in moist, but well-drained, deep, sandy soil where it reaches 100' heights and diameters of 3'.

The trunks of mature trees have orange-brown bark broken into papery scales. In keeping with its name, longleaf pine features slender, flexible needles up to 18" long carried on the branches in groups of three. Cones up to 10" long develop in the second season following its blooms.

Longleaf pine has a very thin band of nearly white sapwood surrounding its resinous orange-yellow heartwood. The wood rates as straight-grained, extremely hard, strong, durable, and, at about 42 pounds per cubic foot

Natural range

air-dry, nearly as heavy as sugar maple. Rapidly grown plantation trees produce wood with a somewhat coarse texture, resulting from the difference in density between light earlywood and heavier latewood.

Uses in woodworking

Mills across the South process the newly appreciated longleaf pine into cabinet-class lumber as well as an extensive list of construction and architectural grades. That means you can craft it into just about anything. Don't plan on using it for naturally finished projects outdoors, though, unless you buy the treated variety or coat it with primer and paint.

Availability

Home centers and lumberyards carry longleaf pine boards (called Southern pine) in common grades (Nos. 1, 2, etc.), but not always the clearer finish grades (C, C&Btr.). These may have to be special-ordered. Better grades run about $1 per board foot.

PERFORMANCE PROFILE

longleaf pine
(Pinus palustris)

Longleaf pine

Longleaf pines are large trees, which means that you can buy thick, wide boards and timbers greater than 5×5". Finish-grade boards, generally clear except for a few tight knots, are your best bet for natural-finish projects. Otherwise, No. 1 Common and Better will yield about 66⅔ percent clear cuttings.

Because longleaf pine has primarily been delivered to the construction industry, even kiln-dried wood can have a moisture content of from 15-19 percent. The drier boards carry a stamp that reads either "KD15" or "MC15"—averaging about 12 percent. Even this wood you'll want to store for a few weeks in your shop and let it acclimate to the relative humidity. When you're ready to work it, heed the following guidelines.

Machining methods

• Although botanically classified as a softwood, you'll find longleaf pine to be quite a hard wood. So use power, not hand tools.

• Because this species of pine is a resinous one, the pitch or gum tends to collect on saw blades and other cutting edges. To avoid the burning and blade wander that comes from gum buildup during ripping, stop occasionally to wipe the saw teeth with acetone or oven cleaner. Or, switch to a Teflon-coated blade. Remember the pitch when routing, too.

• Much like Douglas fir, longleaf pine has a tendency to chip and splinter on cuts across the grain. Use a backing board.

• Drill this wood at faster drill press speeds than hardwood, but make it a practice to back the bit out of deep holes to remove cuttings that might burn.

• Although resin can cause problems in sawing and cutting, it doesn't hinder adhesives, unless there's an obvious sap pocket in the joint.

• Before painting, seal any knots or pockets in the wood with shellac to prevent bleed-through.

• Longleaf pine accepts stains nicely if you first prepare the wood with a thinned washcoat of shellac or wood conditioner to get even stain penetration.

• All pines, but especially longleaf, tend to darken with age, so select your stain color or clear finish with that in mind.

Carving comments

• The difference in hardness between the latewood and earlywood makes the wood very difficult for detail work.

• Because of splintering, limit long cuts with the grain.

• Clean gum buildup from power-carving cutters.

Turning tips

• Let any resin droplets on turned wood dry. Then scrape them off before finishing.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions—and special tips pertaining to this issue's featured wood species—appear under other headings elsewhere on this page.

•For stability in use, always work wood with a maximum moisture content of 8 percent.

•Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/32".

•For clean cuts, rip with a rip-profile blade having 24-32 teeth. Smooth cross-cutting requires at least a 40-tooth blade.

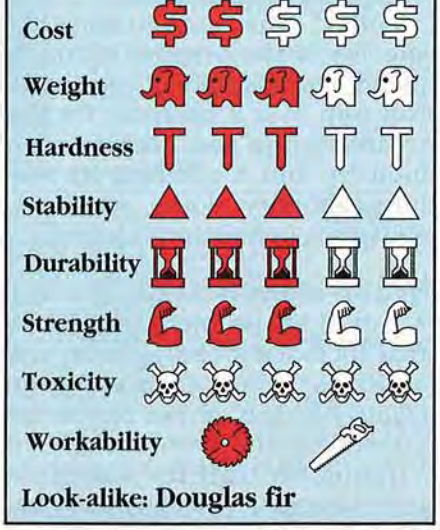
•Avoid using twist drills. They tend to wander in the wood and cause breakout in the hole. Use brad-point bits and a backing board under the workpiece to reduce tearout.

•Drill pilot holes for screws.

•Rout with sharp, preferably carbide-tipped, bits and take shallow passes to avoid burning.

•Carving softwoods generally means fairly steep gouge bevels—20° or more—and deeper cuts.

LONGLEAF PINE AT A GLANCE



Compiled with woodworkers Ian Gresham and Jeff Ester Illustrations: Steve Schindler

FRETWORK MASTERPIECES

You haven't witnessed complex scrollsawing until you've seen what Minnesotan Carl Weckhorst produces!

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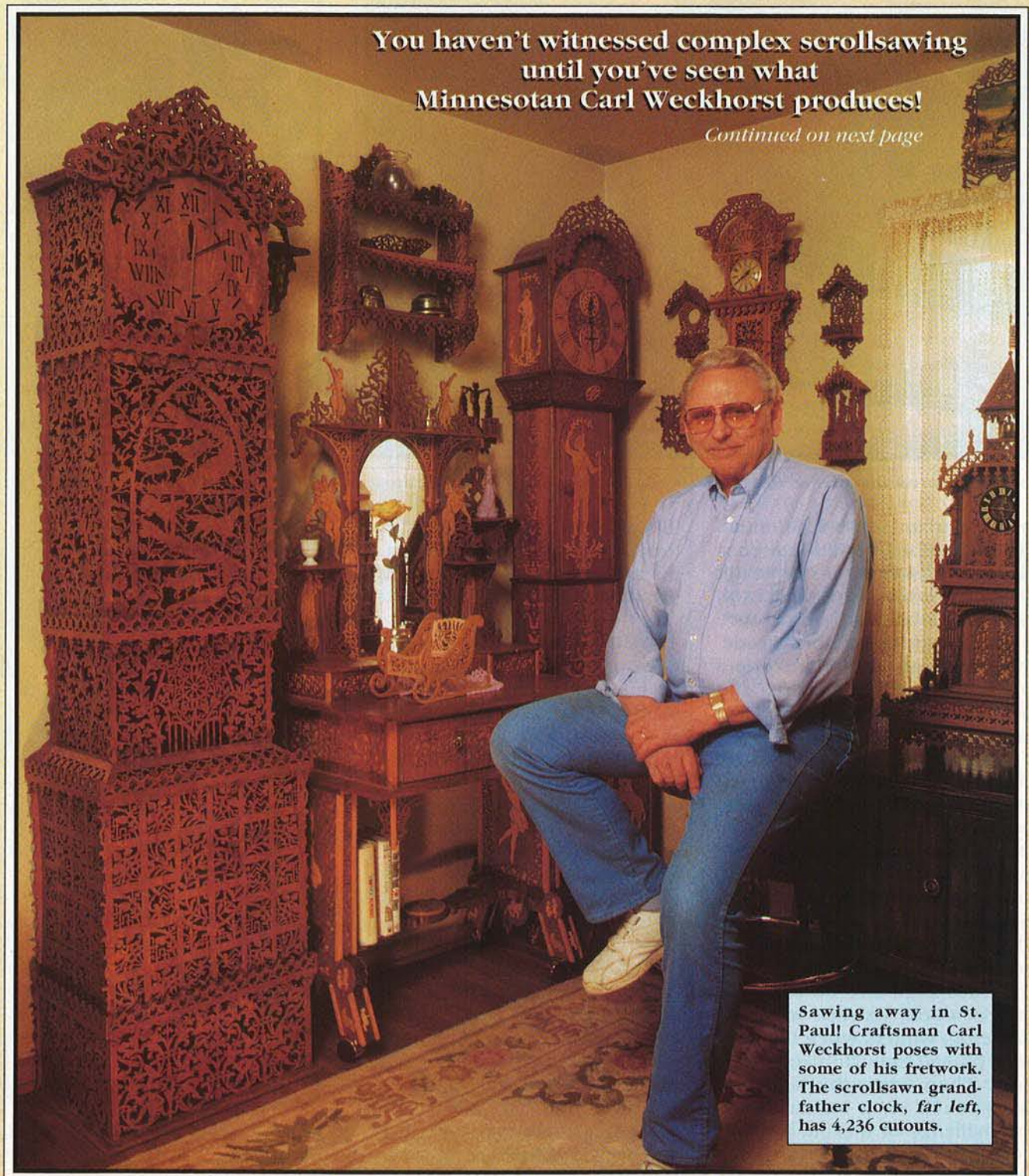


Sawing away in St. Paul! Craftsman Carl Weckhorst poses with some of his fretwork. The scrollsawn grandfather clock, *far left*, has 4,236 cutouts.

FRETWORK MASTERPIECES

The large patterns that Carl prefers to cut out require a scrollsaw with a 30" throat.

To drill clean blade start holes in his fretwork patterns, Carl chucks a 19-gauge brad into his drill.

The more difficult the cuts in a pattern, the more Carl likes it. Here, the lacy cutouts on either side of the leaf present a real challenge.

In suburban St. Paul, Minnesota, there's a veritable mecca for scrollsawers. It's not built of granite or marble, though. And there isn't a billboard or marquee to announce the exhibits inside. The only sign happens to be a folksy cutout attached to the garage door. It reads: "Retired and enjoying it." But for Carl Weckhorst, the owner of the building and the neatly trimmed home next to it, that phrase really says it all.

At 71 years young, Carl has been scrollsawing for more than 30 years. For the past nine (since his retirement), he's been able to practice his craft whenever and for however long he wants to. That means all afternoon, seven days a week, except in those Minnesota winters when temperatures plunge into the deep-freeze zone. Then, even the heater in Carl's 14×18' shop building—and the challenge of making just one more intricate cut—won't keep him warm. However, the down time isn't wasted. He uses it to pour through catalogs of patterns, planning the thrill of future cuts.

Three decades of classic cutouts

By his own breakdown, Carl has made 253 scrollsawn projects (at this writing) since he began in earnest during the early sixties. To professional scrollsawers adept at turning out items for the craft-show market, that's not much production. But consider this *partial* list: three grandfather clocks (one has 4,236 cutouts), 18 wall clocks, 23 mantel and table clocks (some resembling 36"-tall gothic cathedrals), two parlor cabinets (each over 6' tall), 38 picture frames, 66 wall shelves and hanging cabinets, four bird cages, a writing desk, and even a model Eiffel Tower that stands 36" high! And Carl still has most of them, proudly on display for he and his wife, Phyllis, to admire.

Sell them? Hardly. Carl gave up his other former pastimes of fishing, hunting, and golf to spend more time at scrollsawing. You see, it's the doing that he enjoys.

"I like the patterns with the most intricate cutouts," Carl admits, the inflection solidly verifying his Norwegian ancestry. "And there's lots and lots of them I want to make yet."

Standing a little over 72" high, the fretwork parlor cabinet commands attention. Built in sections, it took Carl two years of part-time sawing to complete.

Reviving fretwork's Golden Age

From the early 1800s until about the 1920s, fretwork was big in the United States and England. The art of cutting open, ornamental designs in wood with a framed, thin-bladed handsaw (a coping, or fretsaw) was a popular, safe, and inexpensive parlor hobby for the whole family. Even when the foot-powered scrollsaw came along in 1865, the machine was painted and decorated with pin stripes so that it would look well in the living rooms of the era.

The patterns for that golden age of scrollsawing evolved from the delicate latticework found on Chinese Chippendale furniture and reflected the "gingerbread" of Victorian architecture. Pattern suppliers were numerous. But perhaps the largest in the U.S. was H. L. Wild of New York, New York, (1876–1939) whose catalog covered everything from parlor cabinets to mirrors and bird cages. It was copies of those Wild patterns that kindled Carl's craving for fretwork.

"When I was a boy on our farm in western Minnesota, I cut out toys from apple crates with a coping saw," recalls Carl. "I used to trace patterns from pictures in catalogs and magazines—cowboys, Indians, horses, all that."

In 1958 Carl purchased a BWI benchtop scrollsaw and once again started sawing as a hobby. "I was farming at the time and didn't have much leisure. Then, I started working for the state highway department, and had more spare time," he says. "But because there weren't any fretwork patterns around that I could find, I just cut out simple shapes for painted lawn ornaments and signs, and did some woodcarving."

Desperate for scrollsaw patterns, Carl ran a classified advertisement calling for them in a national woodcarving newsletter. The results were more than he had hoped for. "A fella in Ohio wrote to tell me that he had a bunch of

Continmued

FRETWORK MASTERPIECES

original H.L. Wild patterns," Carl remembers. "I paid him $60 for them all."

From then on, Carl was continuously turning up more classic patterns. At a local mall craft show, he met a shop teacher whose father had a collection of fretwork designs. Carl traded for them. Next, he heard about a farmer near New Prague, Minnesota, who had more H. L. Wild patterns, especially of furniture items (he turned out to have the entire catalog). Carl paid to copy them.

Today, Carl will still track down an occasional pattern, or swap patterns with another scrollsawer, but he mostly relies on a Wisconsin supplier. "Jim Reidle [Wildwood Designs, Inc., P.O. Box 661, Richland Center, WI 53581] has more than I can ever cut," admits Carl. "It seems that fretwork is undergoing a real revival among scrollsawers. There's more patterns now than ever before."

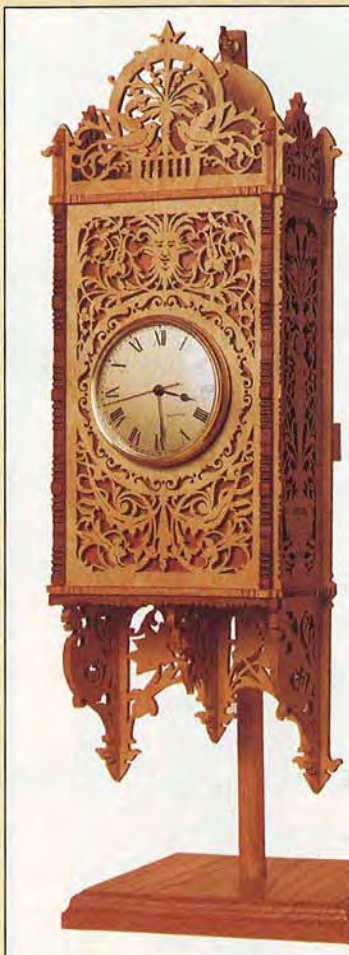
What it takes to saw for detail

Fretsawing usually implies cutting out a pattern from material ¼" or less in thickness (occasional projects may require stock up to ¾" thick). In the old days, fretsawers relied on stock that was hand-planed to thickness. Nowadays, practitioners like Carl purchase Baltic-birch plywood or solid-core hardwood plywood for their projects. "But you must make sure that all the plywood you use is either solid-core or of many plies, such as Baltic birch," Carl advises. "Otherwise, edges of the cuts will chip out."

Modern fretsawers also have moved up to motorized scrollsaws. Carl, for instance, takes pride in his Excalibur heavy-duty model with its 30" throat (he can cut to the center of a 5' panel). "You watch while I show you no vibration," he says as he places a nickel on edge on the saw's table, then turns it on. "See, that's

Are you a scrollsawn fretwork fancier?

If you have classical fretwork patterns you'd like to share, or would like more information on how you could help realize the dream of a major fretwork museum, write (enclose a SASE, please):
Carl E. Weckhorst, 2449 North Dale Street, St. Paul, MN 55113.

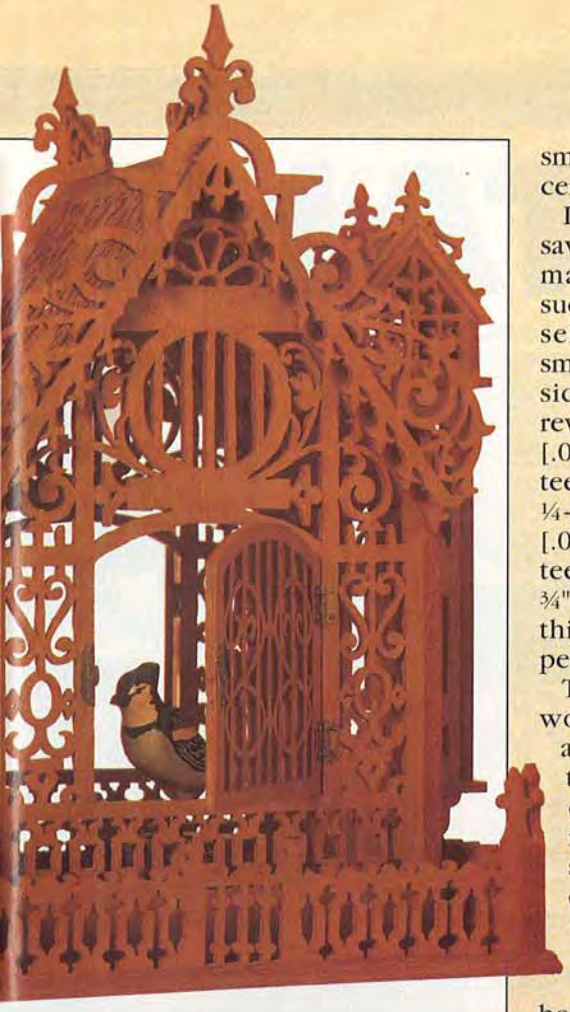


Above: **Carl traded for the pattern for this Italian-design clock made of Baltic-birch, ⅛" plywood stained a walnut tone.**

Above right: **Turn-of-the-century fretwork pattern books featured elegant bird cages like this one of Carl's. It's 20" tall and stained walnut.**

Right: **One of Carl's 44 fretwork clocks, called the Chimes of Normandy, stands 40" tall.**

Far right: **A table lamp such as this, sawn from ¼" cherry plywood, might have graced a Victorian-era parlor.**



smooth," he comments as the five-cent piece remains motionless.

In fretsawing, as with all scrollsawing, the right choice of blades makes the difference between success and failure. And Carl has selected his favorites. "To get smooth, splinter-free cuts on both sides of the piece, I like Olson reverse-tooth blades. I use a size 2 [.014 thick × .032" wide with 20 teeth per inch] for ⅛" stock. For ¼-½" stock, I go to the size 5 [.016 thick × .038" wide with 12.5 teeth per inch]. Then, for heavy ¾" stuff, I put in a size 20 [.022 thick × .100" wide with 9 teeth per inch]."

To adhere the patterns to the workpiece, Carl relies on spray adhesive. "On a real large pattern, rubber cement gets real dry and lifts up before I'm finished cutting," notes the scrollsawer. "Spray adhesive won't do that, and the pattern comes off real easy with lacquer thinner or lighter fluid."

For drilling the blade start holes for each of his inside cuts, Carl has found that a 19-gauge brad (and other appropriate sizes) fitted in his drill works perfectly. "A regular drill bit breaks out the wood on the backside. Brads don't, especially in real tiny spaces," he advises. Before he starts sawing, Carl first drills all the blade start holes in a pattern.

Due to the smooth-cutting blades, this scrollsawer's pieces require only a wipe or two with coarse No. 2 steel wool to clean up the back side. He never sands. And two coats of spray Deft complete his finishing.

The huge scrollsaw might be the center of attention in Carl's shop, but other tools see plenty of duty, too. "I use my oscillating spindle sander for lots of edgework," he says. "Then, I've got an old 10" tablesaw, a bandsaw with a resaw blade, a 12" planer, and that ancient 1" belt sander there. Why, I had that back on the farm even, but it sure comes in handy when I have to just take a hair off a piece to get a good fit."

The museum of yesteryear

To the visitor, Carl and Phyllis' home is not unlike a museum of classical fretwork. Carl's scrollsaw work adorns every wall in the kitchen, living room, two bedrooms, and the basement den. And Carl remembers something about each piece he has created.

"This clock here, I got the pattern for it from a photograph in a magazine. I used the squares' method to enlarge the pattern, because there weren't a lot of copy machines around back then," he says proudly.

Walking from room to room, Carl points out the blue-ribbon winners from the Minnesota State Fair's scrollsaw competition. "I took first place in the event for 24 out of 25 years, you know," he comments. "But the competition seems to keep getting tougher all the time."

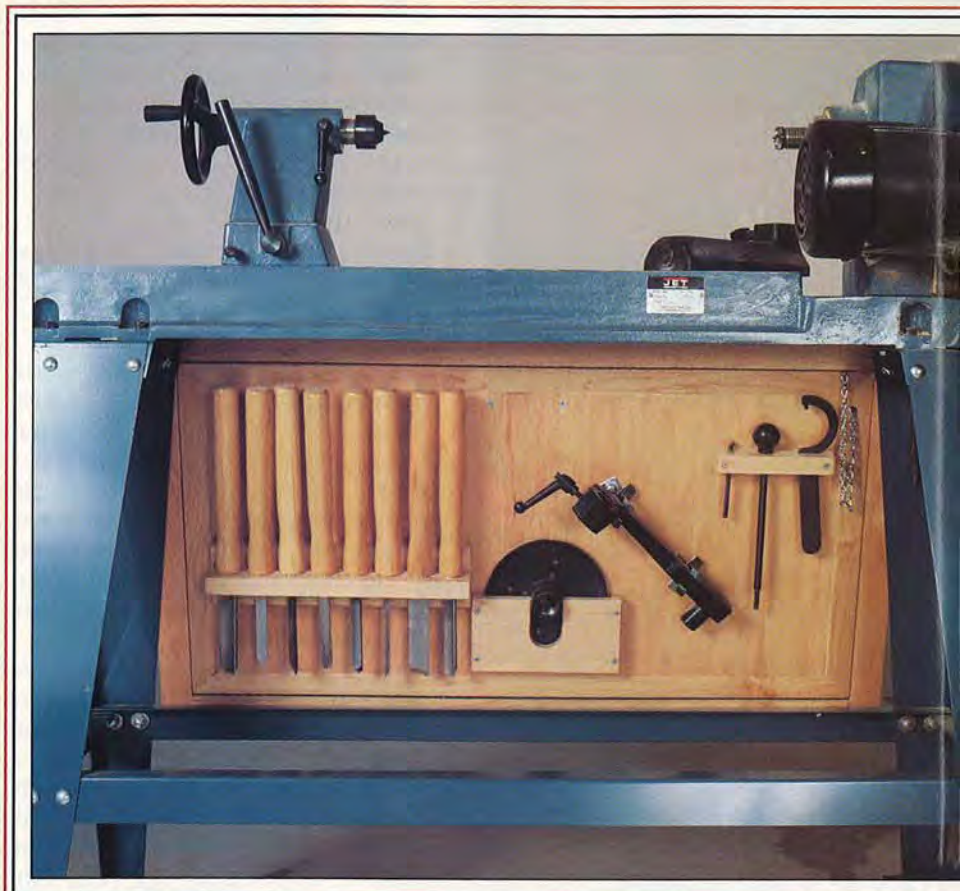
An observer of Carl's fretwork craftsmanship can't help but ponder the thought that his intricately sawn pieces should reside somewhere for the public to enjoy. That thought has crossed Carl's mind, too. "Jim Reidle, over in Wisconsin, has plans to build a fretwork museum there. And I'd probably display my projects in it, and that's only a few years off, according to him. It will be wonderful—the only fretwork display of its kind, and it could be a real tourist attraction.

"I got to do something," Carl adds. "We're running out of room, and there's more I want to make." Phyllis may have the final say regarding more fretwork projects, though. "He has so many [projects] now that are all cut out and stored in boxes. If he doesn't start assembling them soon, I'm going to go through all those cardboard boxes and start mixing up the pieces for him!"

Written by Peter J. Stephano
Photographs: Layne Kennedy

LATHE STAND

On many stand-mounted lathes, there's an empty space beneath the lathe bed that does little besides collect dust. But with this clever add-on, you can create valuable and convenient tool storage in a hurry. Our hinged-door project features holders for chisels, gouges, wrenches, faceplates, and other lathe accessories.



Hinged door viewed from back of lathe.

Note: Our drawings and measurements are for a door panel and frame fitted for Jet's JWL-1236. The size of the pieces needed for other stands will vary. Please measure your lathe stand and tools, and adjust accordingly.

1 Start by cutting the hardwood frame members (A, B) to size. Although the opening on our lathe stand was trapezoidal, we made our frame rectangular for ease in construction.

2 Layout and drill the mating holes. Then, glue, dowel, and clamp the corner joints, checking for square. Later, drill ¼" holes through the wooden frame and metal stand for bolting the frame to the lathe stand later.

3 Cut the door panel (C) to size from ¾" birch plywood.

4 Miter-cut the banding strips (D, E) to size from ¾" stock. Rout 1/16" chamfers along the mating edges of C, D, and E where shown on the Front View drawing.

5 Cut or rout ⅛" grooves ¼" deep along the mating edges of the banding strips (D, E) and plywood door panel (C). Cut splines to the sizes listed on the Exploded View drawing. Next, glue, spline, and clamp the chamfered banding strips to the plywood panel.

6 On the inside face of the door panel, add a solid-wood tool holder (F) to fit your turning tools. The holes in the holder should be about 1/16" larger than the diameter of the metal ferrule on your turning-tool handles. Add other holders as needed.

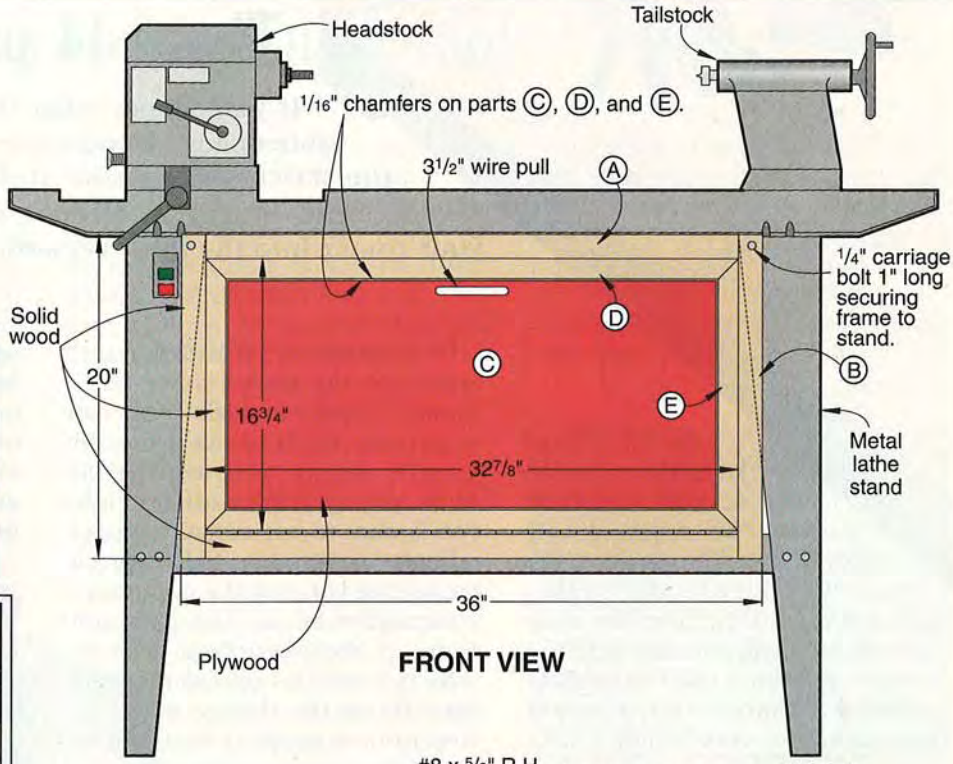
7 Finish-sand the pieces. Mask the plywood door panel. Now, finish the solid-wood banding (D, E) and frame (A, B) with a clear finish. Later, mask the sealed wood, and paint the plywood door panel.

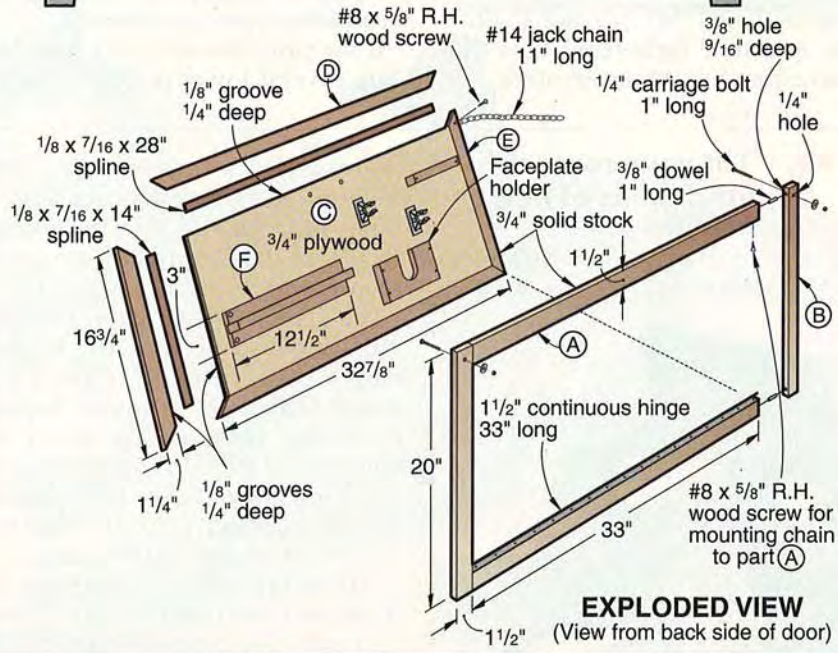
8 Use a piece of 1½" continuous hinge to secure the bottom of the door panel to the top edge of the bottom frame member (A). Bolt the frame to the stand. Finally, to keep the door from opening too far, use an 11" length of chain to connect the door to the frame.

Written by Marlen Kemmet
Project Design: Jim Boelling
Illustrations: Roxanne LeMoine
Photographs: Hopkins Associate

Retrofit

Hinged door (open), viewed from top of lathe.





HIGH-PERFORMANCE ROUTER

These 14 products will make

If you suspect that there's more to routing than rabbets and round-overs, you're right! We surveyed the *WOOD*® magazine staff and contributing editors and came up with a selection of accessories that will turn your router into the most versatile tool in your shop.

1 Beall Wood Threader cranks out screws and nuts

Compared with hand-turned wood threaders, the Beall Wood Threader makes quick work of cutting the male threads by using a router held in a fixture. The kit I tried from Beall includes a V-groove bit, a mounting bracket for your router, plastic inserts for ½", ⅝", ¾", and 1" dowels, and four right-hand taps that correspond to the insert sizes.

In making the wooden handscrews in the photo *above left,* I found it takes some trial and error to get the depth of the router bit exactly where you want it. So once you get the setting right you'll want to cut as many threaded parts as you can. I also recommend that you buy the company's companion book, *The Nuts and Bolts of Woodworking*, $18.95, which contains useful information about the design and construction of projects that feature wooden screws and threads.

If the price seems steep, you can buy several lower-priced versions of this kit. The bracket with a ½" tap and insert sells for $69. You can get a bracket and one of any other size tap and insert for $75. Or you can buy a kit with bracket, ½", ¾", and 1" taps, and matching inserts for $144.

—Tested by Tom Jackson

PRODUCT SCORECARD

Beall Wood Threader

Performance	★ ★ ★ ★ ☆
Price	$179
Value	★ ★ ★ ☆ ☆

Beall Tool Company, 541 Swan Rd. NE, Newark, OH 43055. Call 800/331-4718.

2 Tilt your router for dozens of new profiles

If you've ever wished you could tilt a router bit, you'll want to know about a device called the Angle Ease. It consists of a wooden router clamp, two brackets that hold the clamp, and a router-table insert.

The clamp tilts 45° from vertical in one direction and 10° in the other direction. It requires a router with a 3½"-diameter motor housing, such as the Black & Decker 3329, Elu 2721, Bosch 1604, or Porter-Cable 690. And a newer version accepts Porter-Cable's 7518 and 7519 routers.

Although the Angle Ease is designed for router tables, you can use the unit for freehand routing too. Just turn the Angle Ease right-side up and push the edge of the insert along a fence.

I found the Angle Ease well built and easy to use. With it I can cut angled slots and grooves, create new cutting profiles with my old bits, and rout chamfers at odd angles like 22.5°. I recommend it as a way to increase the usefulness of your router bits and the scope of your projects.

—Tested by Jim Downing

PRODUCT SCORECARD

Angle Ease

Performance	★ ★ ★ ★ ★
Price	$102.99 (7 3/4" X 10 1/4") insert $107.99 (9 1/4" X 11 3/4") insert
Value	★ ★ ★ ★ ★

Woodhaven, 5323 W. Kimberly Rd.,Davenport, IA 52806. Call 800/344-6657.

ACCESSORIES

your router a woodworking super tool

3 Leigh Dovetail Jig offers mortising attachment

Leigh Industries recently added this Mortise-and-Tenon Attachment as an accessory to their Dovetail Jig. As with the dovetail operation, the Mortise-and-Tenon Attachment allows you to vary the width, depth, height, and spacing of the parts of the joint.

In comparing my old Leigh Jig to the new model that came in for this test, I noticed that the new model comes with quick-change cam clamps to secure your workpieces. Owners of the older models can buy a set of four of these cam clamps and the hardware for about $35 to retrofit their jigs. The convenience is well worth the price. I also like Leigh's new and improved instruction manual.

The Mortise-and-Tenon Attachment sets up for a full range of joints including raised or flush tenons, through or blind mortises, finger joints, and half-blind finger joints. The jig normally cuts tenons with round shoulders, but you can adjust it to cut square tenons and then just chisel the mortise corners square. The jig and attachment will handle stock up to 24" wide.

It takes a couple of evenings to assemble the jigs and learn how to use them. After that, I've found I need only about 15 minutes (and a piece of scrap wood) to make the test cuts required to perfect a new joint profile.

In terms of materials and construction, everything fits well and locks positively for repeatable accuracy. The jig is expensive, but I think it's worth it. Once you get familiar with the jig, you can rout joints in minutes that would otherwise take hours by hand.

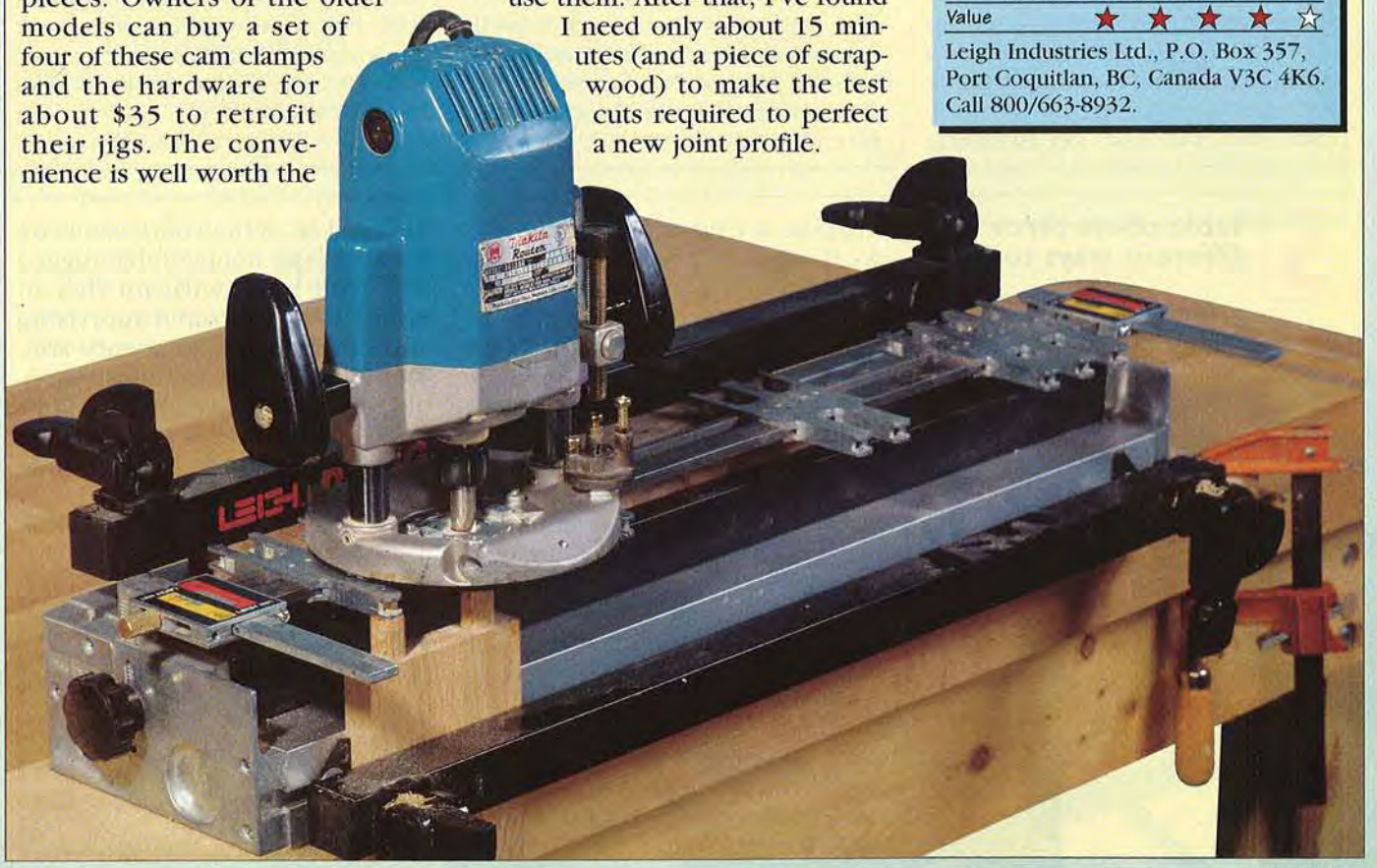
—Tested by Bob Settich

PRODUCT SCORECARD

Leigh model D3 Dovetail Jig and Mortise-and-Tenon Attachment

Performance	★ ★ ★ ★ ★
Price	24" Dovetail jig: $379. Mortise-and tenon-attachment: $199.
Value	★ ★ ★ ★ ☆

Leigh Industries Ltd., P.O. Box 357, Port Coquitlan, BC, Canada V3C 4K6. Call 800/663-8932.



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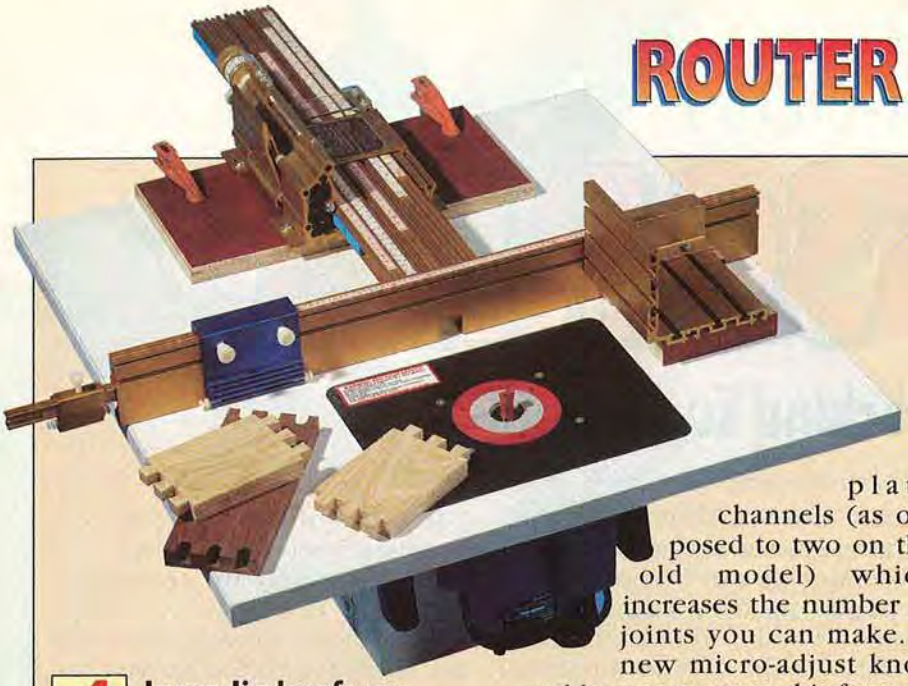


4 Incra Jig beefs up components, adds micro adjustment

Over the past decade, the Incra Jig has evolved from a simple fence-positioning device into an elaborate joinery system. I recently had a chance to try the latest version, the Incra Jig Ultra 16".

At the heart of the system is a sawtooth rack in the carriage that allows you to move the fence up to 17½". The Incra Ultra offers a beefier anodized-aluminum fence and carriage that helps to eliminate flex. You also get five template channels (as opposed to two on the old model) which increases the number of joints you can make. A new micro-adjust knob enables you to move this fence in increments as small as .001". A fence stop and right-angle fixture complete the system.

I worked with the jig for most of a day before I could create tight-fitting box and dovetail joints. To advance to the elaborate joints shown in the company's promotional literature requires even more study and trial-and-error. The instruction booklet was well organized, clearly illustrated, and helpful, but you have to study the instructions thoroughly to use the jig effectively.

In using the jig, however, I found the Incra Ultra well made and thoughtfully designed for quick, repetitive operations. I recommend that you use a router table that measures at least 24×32" with the router plate insert mounted near the edge of the table rather than the middle.

I also found that the 3"-high fence and 6×6" right-angle fixture limit the size of workpiece you can use. I had no problem with box and drawer sides, but any workpiece longer or wider than about 16" starts to feel unwieldy. These minor limitations aside, I had a lot of fun working with this tool. For woodworkers who want to create spectacular decorative joinery, the Incra Ultra works hard for the money.

—Tested by Dave Henderson

PRODUCT SCORECARD

Incra Jig Ultra 16"

Performance	★ ★ ★ ★ ☆
Price	$245
Value	★ ★ ★ ★ ☆

Taylor Design Group, Inc., P.O. Box 810262, Dallas, TX 75381. Call 214/484-5570.

5 Table offers three different ways to rout

Imagine a router table that also works as a horizontal mortising machine and a pin router. That's the package you get with the Porta-Nails Universal Router Table and accessory arm.

The 16×20" cast-aluminum table features a built-in miter-gauge slot, two holes for starter pins, and a circular polycarbonate plate insert. A second vertical mounting plate allows you to attach another router and use it as a horizontal mortising tool. By turning a hand crank you can raise or lower this plate up to 7".

The optional cast-aluminum arm attaches to the top of this vertical plate. At one end you can fasten a polycarbonate safety shield or a steel pin supplied with the arm to use it as a pin router.

I found all of the components on the Universal Router Table rugged and well built with no flex in either the horizontal mortising attachment or the accessory arm. The Porta-Nails is the most versatile router table I've found, and its ability to do the work of three machines makes it a great value for the small shop.

—Tested by Dave Henderson

PRODUCT SCORECARD

Universal Router Table

Performance	★ ★ ★ ★ ☆
Price	Table with horizontal routing attachment: $359. Pin routing attachment: $49.95
Value	★ ★ ★ ★ ★

Porta-Nails, Inc., P.O. Box 1257, Wilmington, NC 28402. Call 800/634-9281.

6 Big, sturdy fence works with even the tallest bits

CMT designed this cast-aluminum router fence to handle any size router bit from 3" panel-raising bits down to ⅛" straight bits. The two replaceable plywood faces on this fence can be loosened and moved in or out to closely conform to the bit's diameter. And the 4" height of the fences ensure that you can rout workpieces with the tallest vertical-molding or panel-raising bit.

A ground cast-aluminum flange holds the fence 90° to the table. This flange attaches to the table with two carriage bolts which come up through slots in the horizontal leg of the flange. The slots give you a range of about 3" to move the fence toward or away from the bit. This system requires that you drill two slots in the surface of your router table, but it holds the fence solidly. A dust-collection hood with a 2½" hose connection is cast into the flange and picks up about 75 percent of the dust generated.

If I were to change anything about the fence, I would make the plastic guard a bit sturdier. Otherwise, if you plan to use a lot of different-size bits, including the tall ones, this fence will give you the height and flexibility you need at a good price.

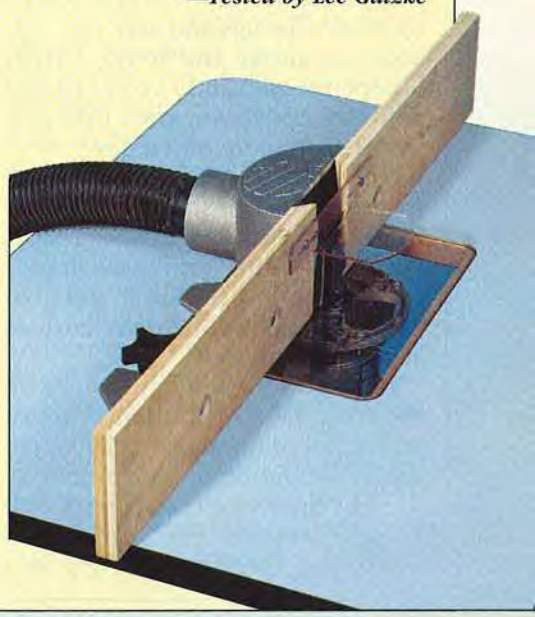
—Tested by Lee Gatzke

PRODUCT SCORECARD

Router Table Fence, RTF-001

Performance	★ ★ ★ ★ ☆
Price	$64
Value	★ ★ ★ ★ ★

CMT Tools, 310 Mears Blvd., Oldsmar, FL 34677. Call 800/531-5559.



7 Table-and-fence package gets you up to speed fast

There are two ways to get started in table routing operations. You can build your own components and buy accessories piecemeal. Or, purchase one of these packages from Eagle America. Except for the router, the Router Table and Fence Package from Eagle America gives you all the components you need. The package includes a 24×32" table, polycarbonate insert, and a fence with a bit guard, featherboard, and stop.

The 1⅛"-thick MDF table is covered with plastic laminate on both sides and includes a miter-gauge slot. The fence's ¾" maple face is held in place by a piece of aluminum angle. All the accessories fit into a T-slot that runs the length of the fence. To collect sawdust, you can hook up a standard 2½"-diameter shop vacuum hose to an adapter on the back of the fence.

I think the Router Table and Fence Package is a good way to plunge into table routing. The components are made well, and you have everything you need with a single purchase.

—Tested by Dave Henderson

PRODUCT SCORECARD

Router Table and Fence Package

Performance	★ ★ ★ ★ ★
Price	$199.99
Value	★ ★ ★ ★ ☆

Eagle America, P.O. Box 1099, Chardon, OH 44024. Call 800/872-2511.

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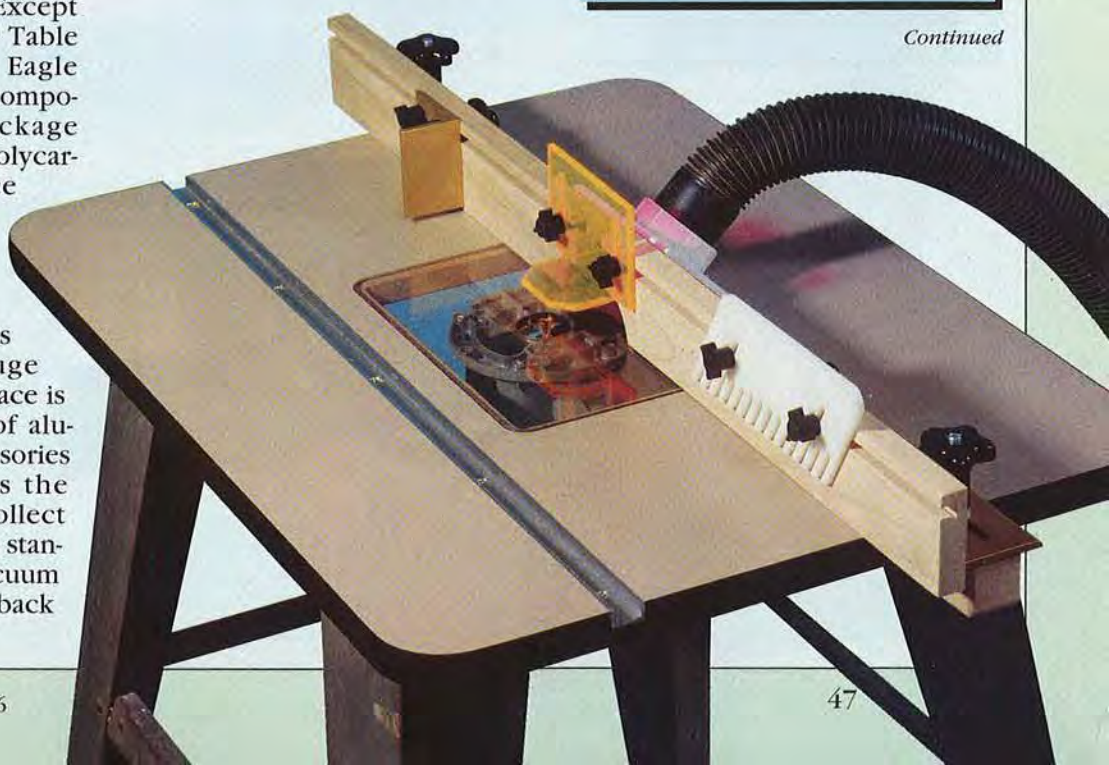


ROUTER ACCESSORIES

8 Jointech offers a feature-laden fence for router tables

If it's versatility you're looking for, the Jointech Smart Fence adapts to numerous jigs and add-ons. You also can move the fence halves independently, and I've yet to find any dust-collection port that performs with more efficiency.

On the top and sides of the fence you can install stops, featherboards, and jigs in the T-slots provided. The company makes accessories to fit the T-slots, or you can make your own custom accessories as well.

The two independent halves on the front face of the fence adjust in 1/64" increments. The bit opening in the fence measures 2×4½", but the fence comes with two plastic zero-clearance inserts. Routing a bit's profile in these inserts proved tricky, but I found the inserts useful when working with small pieces that might hang up in a larger opening. If you want more profiles, you can buy a boxed set of six inserts for $25.

For tall workpieces, the Fence Raiser accessory (about $40) boosts the fence height to 9". This includes the medium-density fiberboard piece that clips into the T-slot on the fence and the featherboard assembly shown *right*.

I tested the 32" Smart Fence and Fence Raiser, but the company also sells 24" versions for about $130 and $35 respectively. The only limitation I found is that you can't use bits taller than 2". Otherwise, the Smart Fence gets my vote as the most innovative router product I've seen this year.

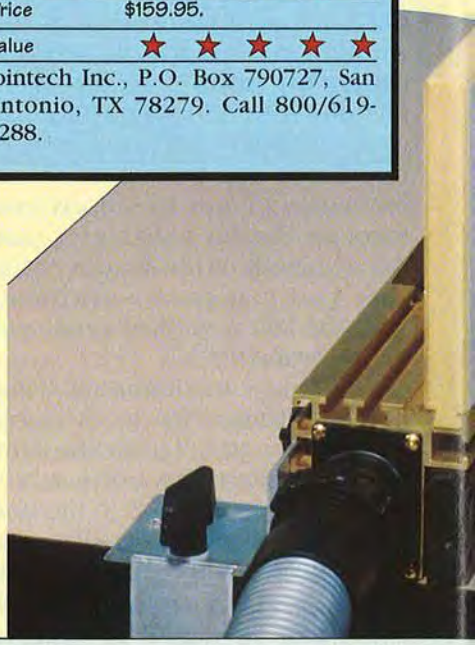
—Tested by Dave Henderson

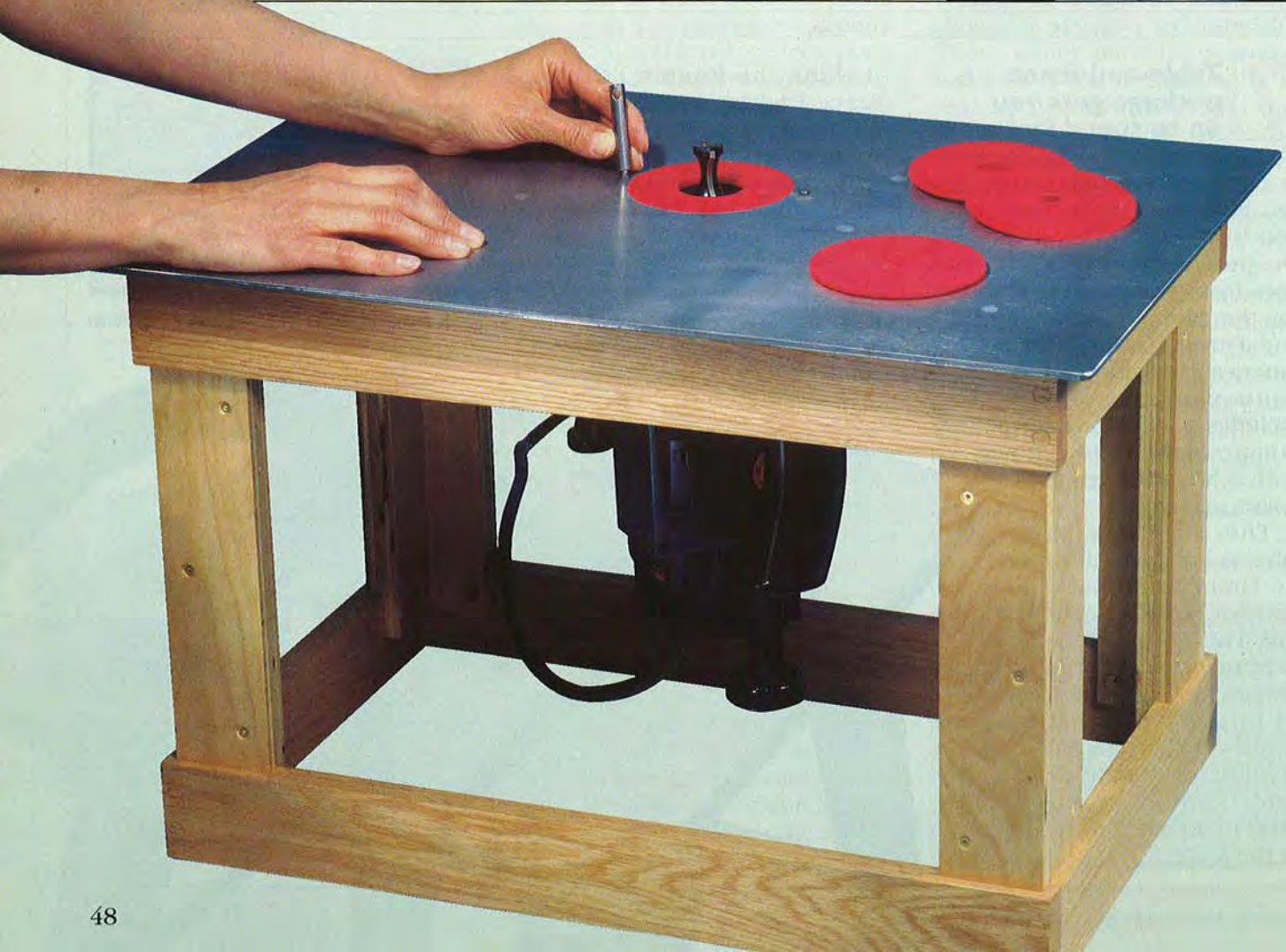
PRODUCT SCORECARD

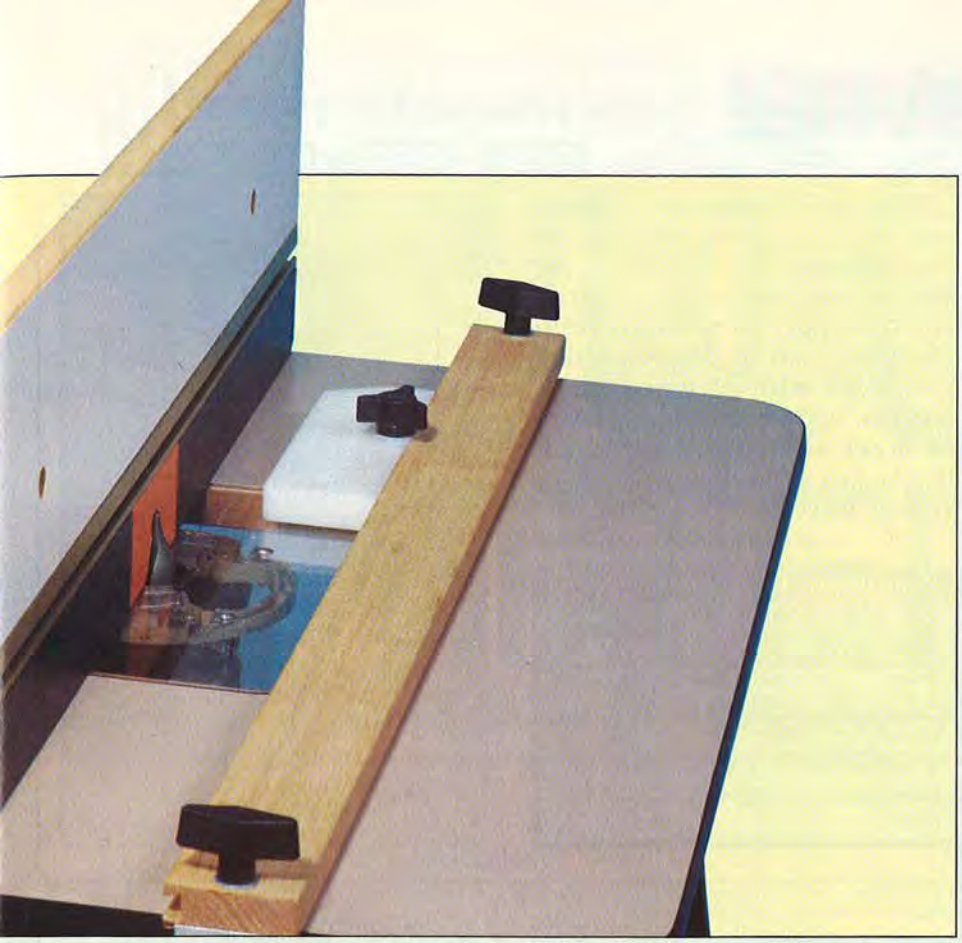
Smart Fence

Performance	★ ★ ★ ★ ☆
Price	$159.95.
Value	★ ★ ★ ★ ★

Jointech Inc., P.O. Box 790727, San Antonio, TX 78279. Call 800/619-1288.







9 Solid-steel table holds router with clamp system

Laminate router tables with acrylic or polycarbonate inserts offer woodworkers many advantages. But the inserts and tables will sag a bit over time. This solid-steel Router Table Top from Veritas offers a super-flat table surface and a quick-change router-clamping system. The 3/16"-thick steel plate does not sag even with the heaviest routers. And the 16×24" top is milled flat to within plus or minus .004".

What I especially like about this table is that you don't have to remove the baseplate from your router. You simply turn the table top over, place your router between the two clamping brackets, snug the brackets up to the baseplate, and tighten the nuts on the clamp bars. The process takes less than a minute.

The 3⅝" bit opening in the table top accepts large panel-raising bits, and the table comes with two plastic inserts that give you openings of ½" and 1½". And you can buy additional inserts for about $4.50 each. The table includes two starter pins and threaded holes in the top for the pins to screw into. On the bottom of the table, four machine-screw studs enable you to bolt the top to a stand of your own construction.

The only reservation I have about this design is that a heavy, 2½–3hp router that lacks a soft-start feature will, when it starts, jerk hard enough to budge the router. If you want to install one of these big routers, I recommend you use a soft-start model.

—Tested by Dave Henderson

PRODUCT SCORECARD

Router Table Top

Performance	★ ★ ★ ★ ☆
Price	$149
Value	★ ★ ★ ★ ☆

Veritas Tools Inc., P.O. Box 1720, Ogdensburg, NY 13669-1720. Call 800/667-2986.

10 Finger-joint router bit saves wood and money

My stack of offcuts grows bigger every year, and until I got this bit, most of my scraps were destined for the woodstove.

With this Freud Finger-Joint Bit you can join two pieces of wood with a glue joint that is stronger than the wood itself. If you match the color and grain of pieces, the joint line is barely noticeable. On painted projects, the joint line disappears completely.

The bit I tested came razor-sharp and easily cut the joint in a single pass. The height of the cutter enables you to join stock up to 1½" thick.

Given the cost, this bit may not represent a great value for everyone. But if you spend more than a few hundred dollars a year on wood, I think you'll find that this bit can pay for itself within a year or two by salvaging the bulk of the scrapwood in your shop.

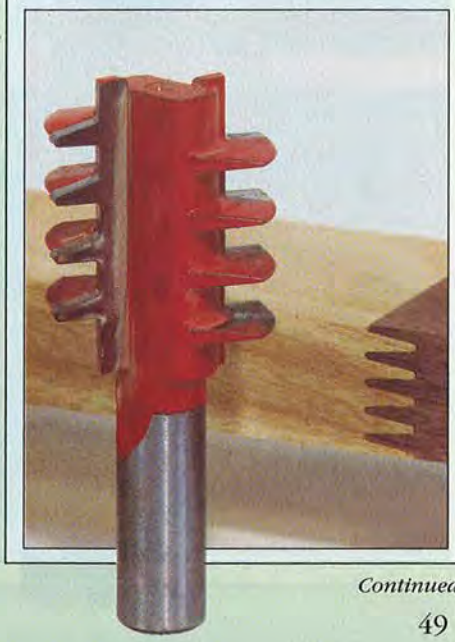
—Tested by Dave Henderson

PRODUCT SCORECARD

Finger-Joint Bit

Performance	★ ★ ★ ★ ★
Price	About $80
Value	★ ★ ★ ★ ★

Freud Inc., P.O. Box 7187, High Point, NC 27264. Call 800/472-7307.



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ROUTER ACCESSORIES

11 Plywood bit comes with up- and down-shear cutters

If you use an upshear router bit to trim plywood, you get tear-out on the top face of the sheet. A downshear bit tears out on the bottom. What to do?

This Up- & Down-Shear Router Bit gives you the best of both cutting angles by splitting the flutes. The carbide on the top edge cuts down and the carbide on the bottom cuts up. I tried this bit on both oak and Baltic-birch plywood and got crisp, clean edges on both faces of the plywood. Routing across the grain of the face veneer produces a nearly invisible line of fuzz on Baltic-birch plywood, but I still consider that acceptable.

These bits come with ½" shanks and in two cutting lengths 1⅛" (#21228) and 1⅜" (#21288). The shorter bit handles ¾" material, and the longer bit will trim a double lamination of ¾" plywood. If you work with plywood, these bits can end the hassle of having to make scoring cuts and the headaches of finding tear-out on an expensive piece of plywood.

—Tested by Dave Henderson

PRODUCT SCORECARD

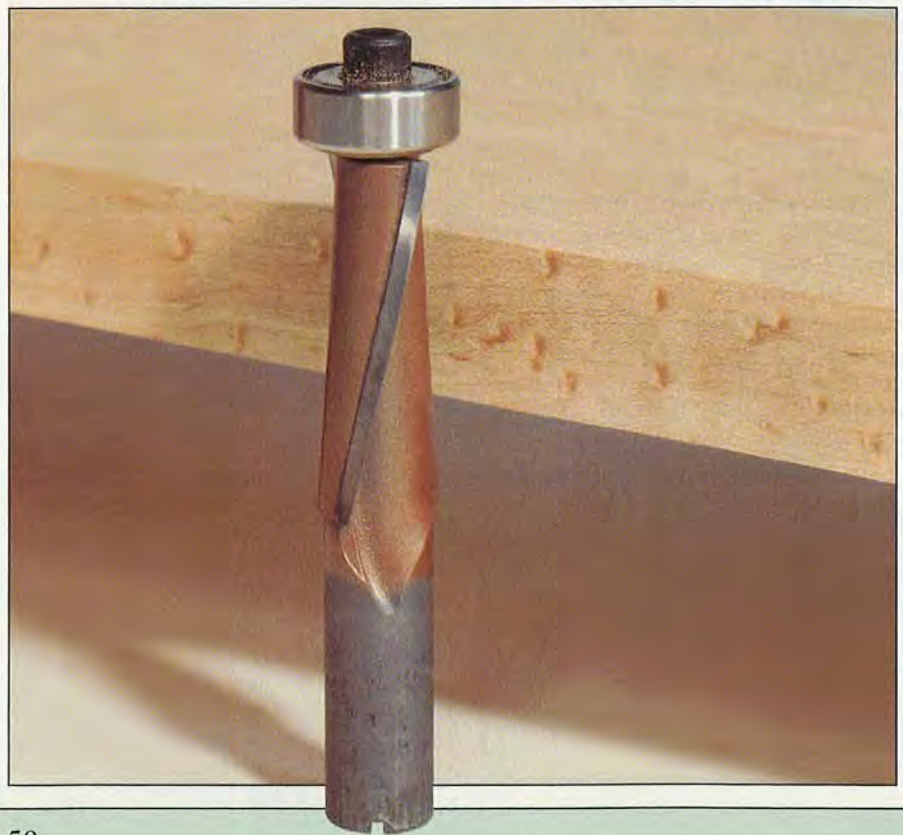
Up- & Down-Shear Bits

Performance	★ ★ ★ ★ ★
Price	#21228: $40.99 #21288: $51.99
Value	★ ★ ★ ★ ★

Woodhaven, 5323 W. Kimberly Rd., Davenport, IA 52806. Call 800/344-6657.

12 Fight figured woods no more with this spiral bit

When it comes to highly figured woods, you often risk tear-out with a traditional straight bit. Woodhaven came up with a solution by mounting a pilot bearing on a spiral bit. The spiral angle of the carbide helps to slice the wood, rather than chop it like a vertical cutter.



With this ½"-shank bit in a handheld router, I made several dozen passes on a wildly figured piece of maple. I got glass-smooth edges with and across the grain. On the top edges of the pieces in cross-grain routing, I noticed a small amount of fuzzing. But that's normal for an upshear flute design and easily remedied with a few light strokes of sandpaper.

The bit I tested had a 1½" cutting length, but you can get the same bit with a 1" length in a ¼" or ½" shank for $13 less. If you do a lot of work with highly figured woods, I recommend that you get one of these bits and put an end to your tear-out problems.

—Tested by Dave Henderson

PRODUCT SCORECARD

Spiral Flush-Trim Bit, #20088

Performance	★ ★ ★ ★ ★
Price	$54.99
Value	★ ★ ★ ★ ★

Woodhaven, 5323 W. Kimberly Rd., Davenport, IA 52806. Call 800/344-6657.

13 Inlay kit produces perfect-fitting pieces

Hand-cut inlays require painstaking patience. You can achieve nearly the same results with the CMT Router Inlay Kit and a few hours of practice. The kit consists of a brass template guide with a locking ring, a snap-on bushing, and a ⅛" solid-carbide spiral bit.

To use the kit, simply cut a female template from hardboard or other ¼" material. Rout your recess by following the inside of the template with the brass template guide. Then place your template over the inlay wood, add the brass bushing, and rout the matching piece. The difference in diameter between the guide and the bushing compensates for the cutting diameter of the bit.

Using a plunge router, I found this system foolproof. The only limitation is that, due to the ⅛" diameter of the bit, you can't cut inlays with square corners.

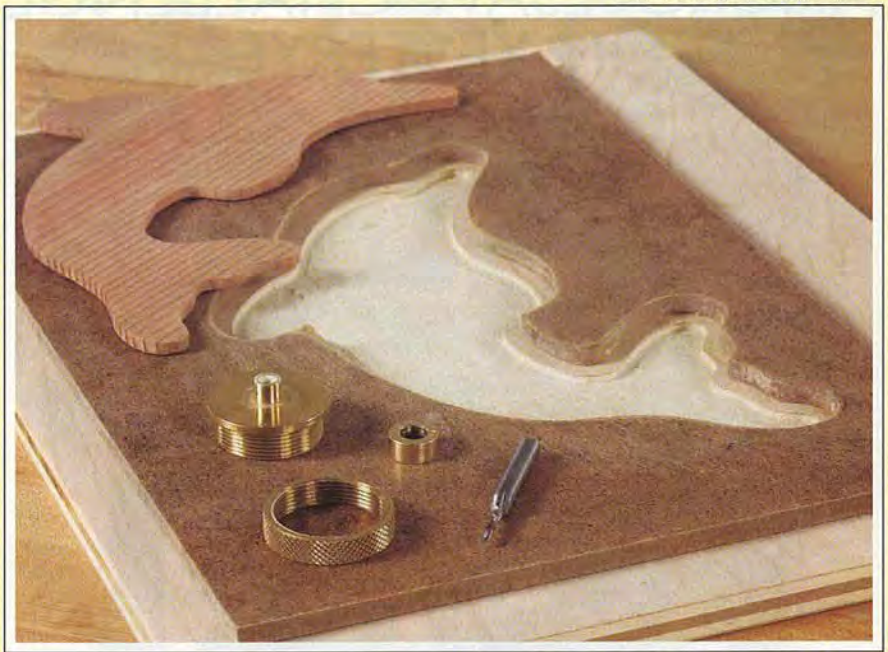
—Tested by Tom Jackson

PRODUCT SCORECARD

Solid Brass Inlay Kit

Performance	★ ★ ★ ★ ★
Price	$29.90
Value	★ ★ ★ ★ ☆

CMT Tools, 310 Mears Blvd., Oldsmar, FL 34677. Call 800/531-5559.



14 Foot switch gives you no-hands control of router

Reaching under a table to turn off a router is like walking behind a mean horse. Both are accidents waiting to happen.

The Billy Pedal Foot Switch allows you to turn your router on and off by just stepping on the pedal—no bending over and no blind groping. You simply plug your router into the two-way prong at the end of the 8' extension cord, and then plug the cord into your power source. The Billy Pedal is rated for 15 amps and can also be used for your tablesaw, bandsaw or most other power tools in your shop.

If you are setting up a router table, I recommend this device. Not only is it good for routinely turning your router (or any other stationary power tool) on and off, but it's a good shut-off switch in case of an emergency too.

—Tested by Tom Jackson

PRODUCT SCORECARD

Billy Pedal Foot Switch

Performance	★ ★ ★ ★ ★
Price	$29.95 ppd.
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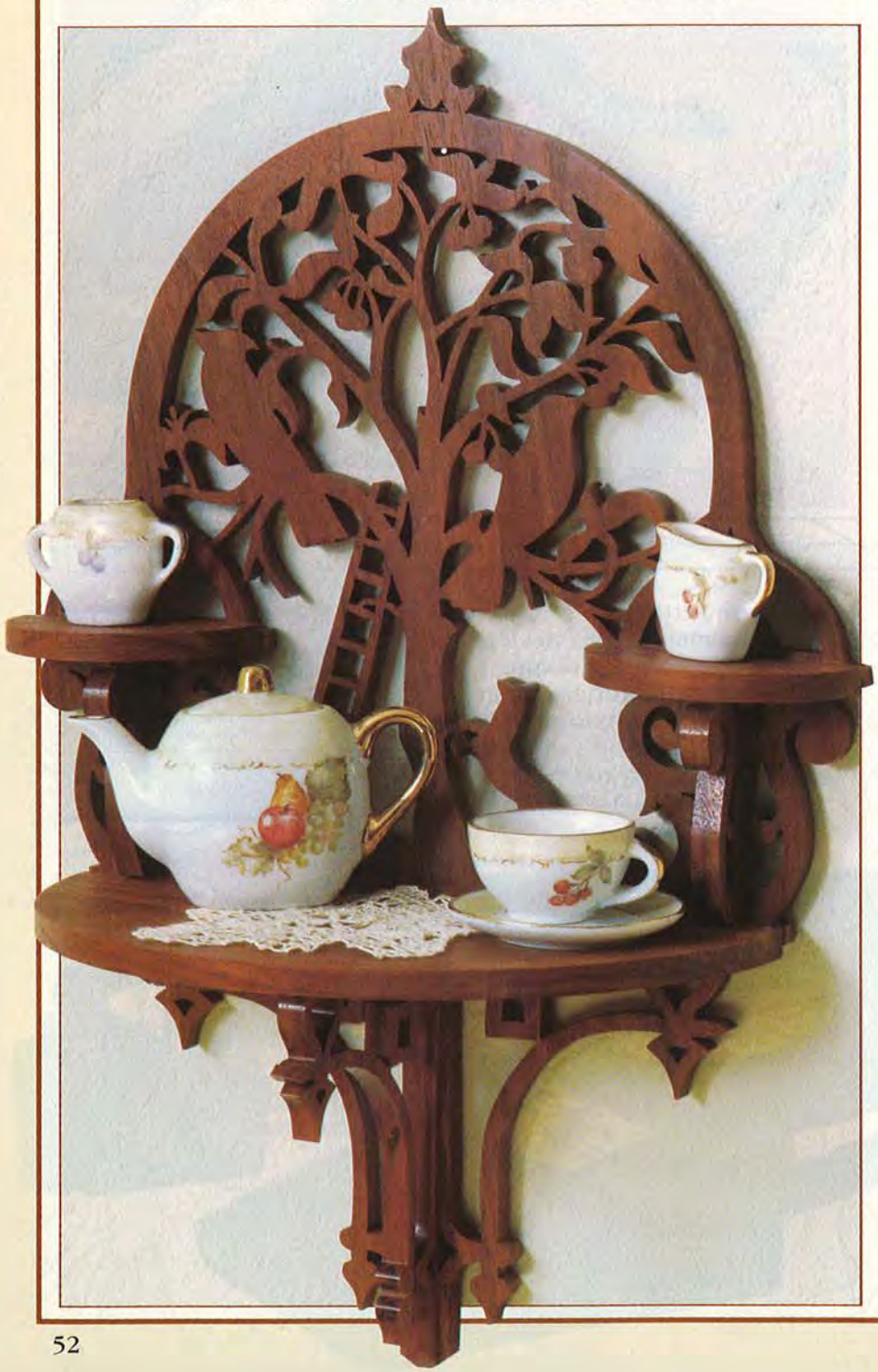
WONDERFUL WHATNOT

A SCROLLSAW CHALLENGE FROM YESTERYEAR



John Nelson combs New England antique shops for old-time fretwork treasures, then takes patterns from them. Here's one of his recent finds, a triple-shelf whatnot with an elaborate silhouetted scene.

***Note**: You'll need 3/8×11×17" stock for the shelf back and brackets and a piece 3/8×5×11" for the three shelves. You can edge-glue narrower stock for the wide piece. We used walnut.*

First, put on the patterns

1 Photocopy the patterns for the back and brackets from the *WOOD PATTERNS™* insert in the middle of the magazine. Make two copies of the side bracket pattern. The back pattern requires an 11×17" sheet.

2 Adhere the back pattern to your stock with rubber cement or spray adhesive. Fit the three bracket patterns into the waste areas around it. Align the arrows on the brackets with the grain. (We placed the side brackets flanking the top of the back pattern and inverted the center bracket to fit at the bottom.)

3 Lay out the three semicircular shelves on the other piece of stock. You'll need one shelf 9" diameter (4½" radius) and two 3¼" diameter (1⅝" radius). Draw the large shelf first, placing the center at the midpoint of one edge of the stock. Then, draw the two smaller shelves along the opposite edge.

4 Cut out the shelves, and set them aside for later. Then, cut the patterned stock apart to separate the patterns for easier sawing. Don't cut along the outlines of the back and brackets yet, however.

Next, cut out the parts

1 Drill 1/16" blade start holes for the inside cuts in the back and brackets. Drill each hole slightly inside the cutting line—not on it—in each shaded area. Drill near a corner or point when possible; it's

difficult to neatly enter a cut in the middle of a straight or slightly curved section.

2 Begin cutting the side brackets. Thread the scrollsaw blade (a #4 blade, .033×.014" with 15 teeth per inch, will do the trick) through a start hole. Make the inside cut, then thread the blade through the next hole.

3 After completing the inside cuts, saw around the outside pattern line. Endeavor to cut the top and back edges, which will be glue joints, straight and true.

4 After cutting out the side brackets, move on to the center bracket, then the back.

5 When sawing the back, start with the smallest inside areas and finish with the largest ones. Then, saw around the pattern outline to complete the piece.

Then, assemble the shelf

1 Ensure that the back and top edges of each bracket are 90° to each other. Sand as necessary to square them up and true the gluing surfaces, taking care to keep the two side brackets the same height.

2 Carefully finish-sand the front and back of each part. To avoid breaking off delicate pieces, lay each part flat on the workbench and hand-sand with a block. Sand with 150- and 220-grit sandpaper.

3 Lay the back facing up on your bench. Then, dry-assemble the shelf, following the Exploded View drawing.

4 Glue the large shelf and center bracket into place, using woodworker's glue or epoxy. Clamp with rubber bands, as shown in the photo *above right*.

5 Next, glue the two side brackets and shelves into place. Clamp them with C-clamps or bar clamps as shown in the photo. Clean off the glue squeeze-out.

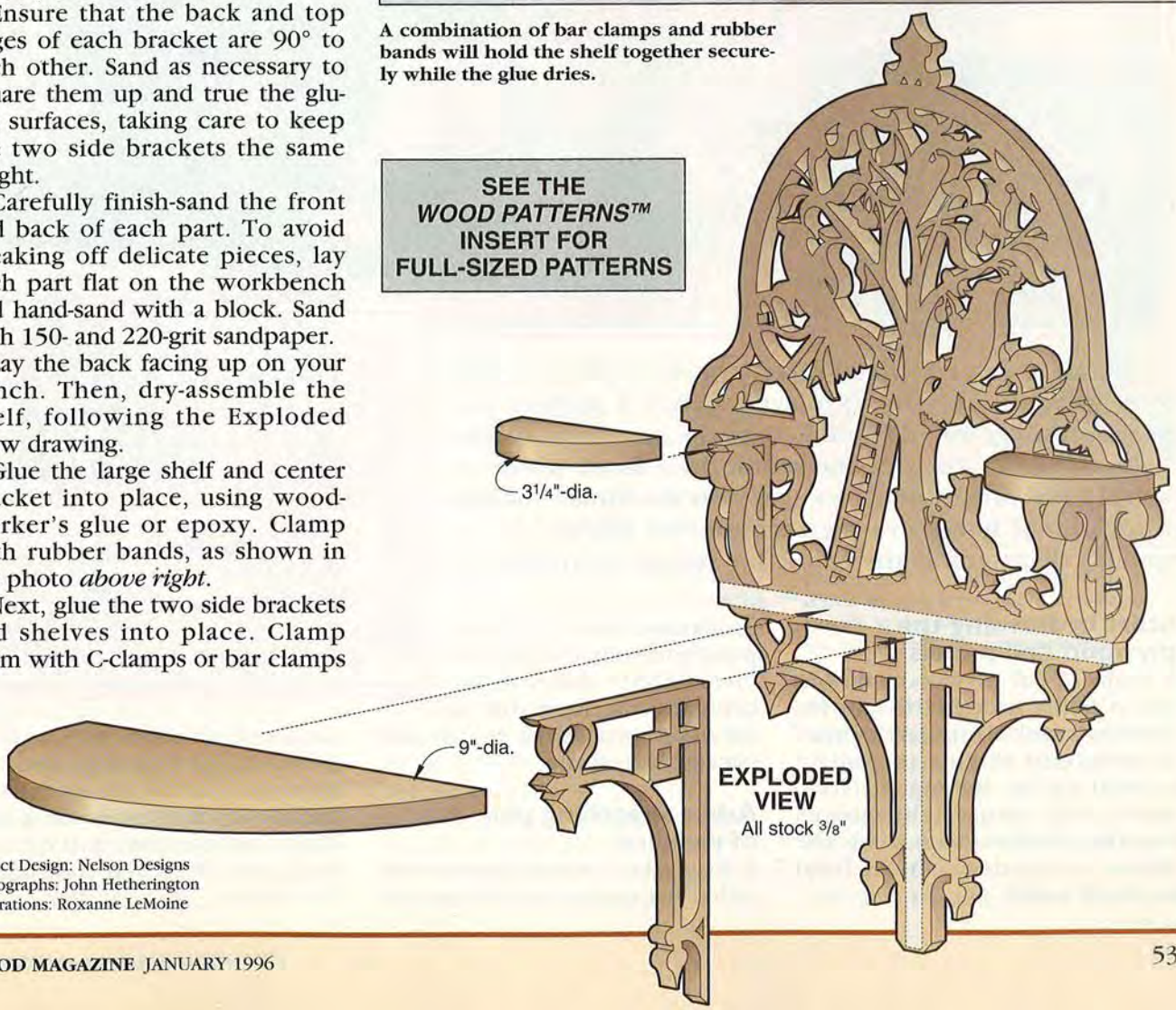
6 After the glue dries, apply a clear finish. Let dry, then attach a hanger at the top on the back.

Buying Guide

Catalog. For a catalog of modern and antique scrollsaw patterns, write to Nelson Designs, P.O. Box 422, Dublin, NH 03444-0422.

A combination of bar clamps and rubber bands will hold the shelf together securely while the glue dries.

SEE THE *WOOD PATTERNS™* INSERT FOR FULL-SIZED PATTERNS



Project Design: Nelson Designs
Photographs: John Hetherington
Illustrations: Roxanne LeMoine

Sweet Dreams CRADLE

A first bed for baby that's stylish, sturdy, and easy to store and transport

If there's an expectant mother at your house (or your son's or your daughter's place), here's a project that you definitely should build. It rocks gently to soothe baby to sleep. To lock the cradle in a fixed position, simply flip down the brass stops on the ends. And the knockdown hardware we recommend allows you to quickly disassemble the cradle for storage or transport.

Start by forming the plywood end panels

1 From ¼" oak plywood, cut four pieces to 22" wide by 15" long for the end-panel blanks (A). Spread an even coat of glue or contact cement on the mating surfaces, and clamp two of the pieces together *back-to-back*, with the edges and ends flush, to form each end panel.

2 Transfer the End-Panel pattern from the *WOOD PATTERNS*™ insert in the center of the magazine to the oak plywood. Cut the two end panels (A) to shape.

Add a matching pair of rockers

1 From 1 1/16" stock (commonly called five-quarter stock), cut the rocker blanks (B) to the size listed in the Bill of Materials. Use your own stock, or see our source for a hardwood kit listed in the Buying Guide accompanying the Bill of Materials. We used red oak for this project.

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
END FRAMES					
A end-panel blanks	*½"	22"	15"	LOP	2
B rocker blanks	1⅛"	4½"	29"	O	2
C top-rail blanks	1⅛"	5"	28"	O	2
D uprights	1⅛"	1½"	29¼"	O	4
E center-rail blank	1⅛"	3¼"	20"	O	2
F cleats	¾"	¾"	16½"	O	2
SIDE PANELS					
G lower side rails	¾"	3¼"	36½"	O	2
H top side rails	¾"	2"	36½"	O	2
I slats	¼"	1"	7¼"	O	32
J spacers	¼"	5/16"	1¼"	O	68
K cleats	¾"	¾"	36½"	O	2
L bottom	¼"	18¼"	36 7/16"	OP	1

*Measure the thickness of two pieces of oak plywood glued back-to-back for actual thickness.

Materials Key: LOP-laminated oak plywood, O-oak, OP-oak plywood.

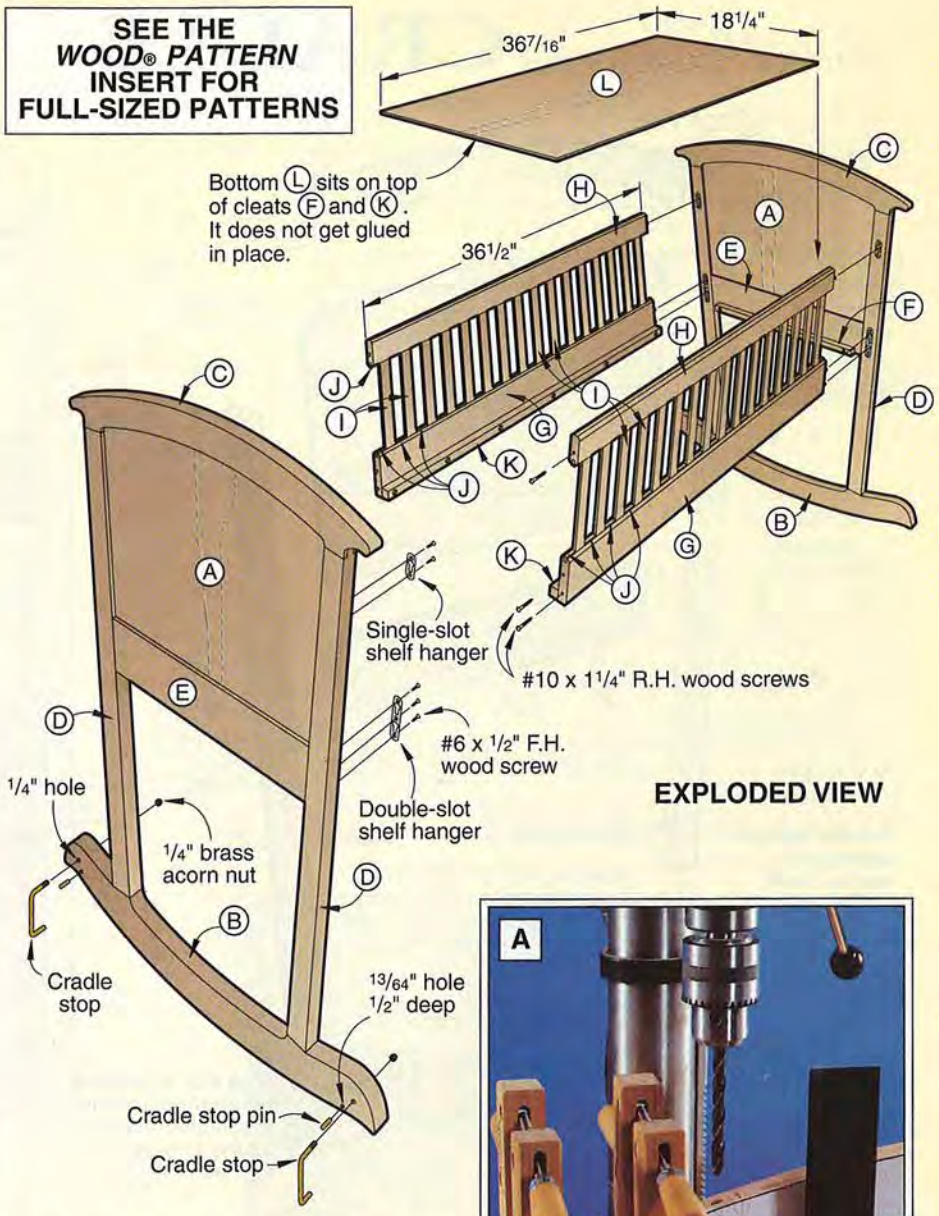
Supplies: 4" deck screws, #8x1¼" flathead wood screws, two 12"-long brass float rods, two ¼" brass acorn nuts, #10x1¼" roundhead wood screws, #6x½" flathead wood screws, finish.

Buying Guide

Hardwood kit. All the individual pieces shown on the Cutting Diagram cut slightly oversized in length and width from the thicknesses listed in the Bill of Materials. Available in red oak ($124.95 ppd.) and cherry (149.95 ppd). Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Or call 800/524-4184 to order.

Keyhole shelf hangers. Two pair of single-slot shelf hangers, part no. 38-891; and two pair of double-slot shelf hangers, part no. 38-895. Call for prices. Constantine, 2050 Eastchester Road, Bronx, NY 10461, or call 800/223-8087.

SEE THE *WOOD® PATTERN* INSERT FOR FULL-SIZED PATTERNS



EXPLODED VIEW

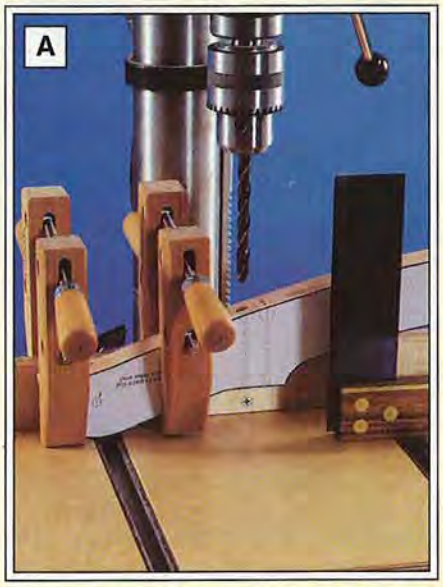
2 Transfer the full-sized rocker pattern (B) from the *WOOD PATTERNS™* insert to one of the rocker blanks. (We cut the paper pattern to shape and used spray adhesive to adhere it.) Bandsaw and sand the rocker to shape.

3 Use the cut-out rocker as a template to mark its shape onto the remaining rocker blank, and bandsaw it to shape. Tape the rockers together face-to-face, and sand the edges flush. Pry the pieces apart, and remove the tape.

4 Chuck a ⅜" brad-point bit into your drill press. As shown in Photo A, clamp one of the rocker blanks to your drill-press fence, with the drill bit aligned with the marked screw-hole alignment centerline on the paper pattern. Using a square, check that the alignment centerline is square to the drill-press table as shown in the photo. Drill four counterbores centered in the *bottom* edge of each rocker.

5 Switch bits, and drill a 5/32" shank hole centered inside each ⅜" counterbore. Repeat for the second rocker.

6 With the pattern still attached, drill four holes in the one rocker for the brass stops and stop pins that will be added later.



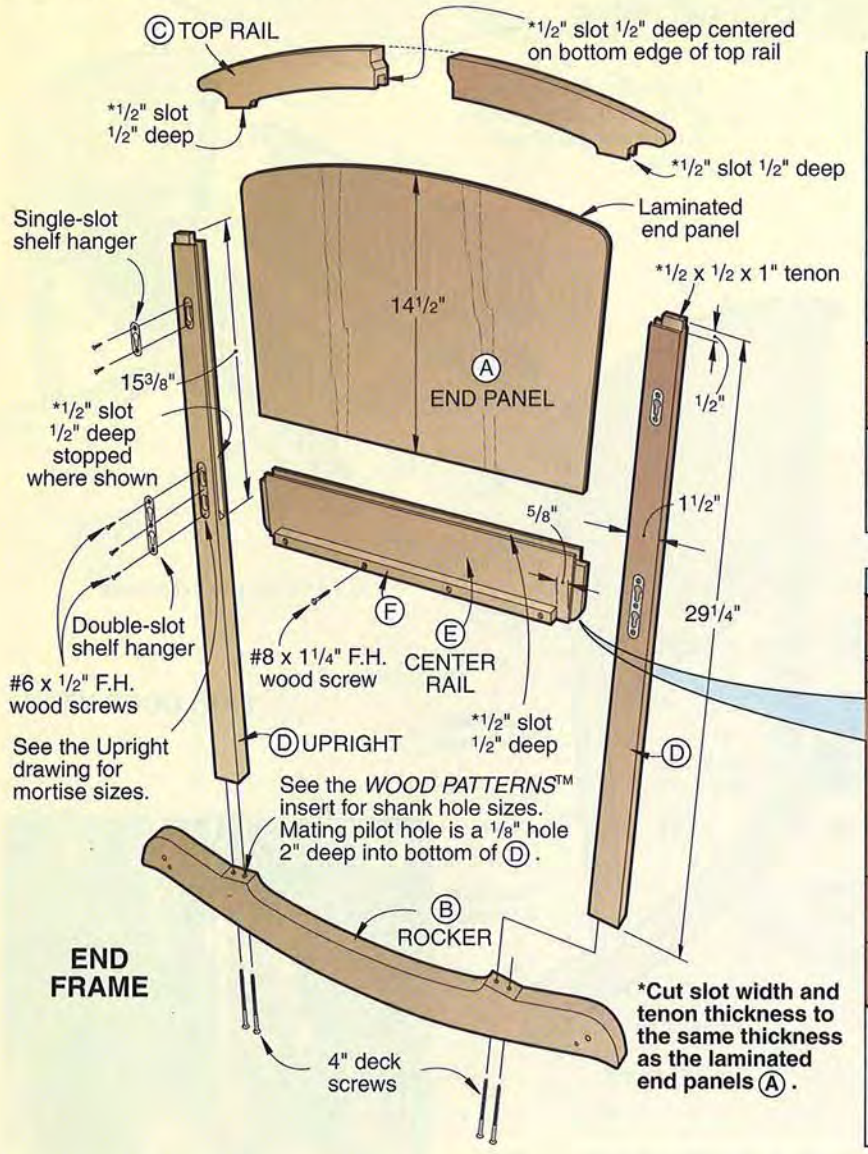
Clamp the rocker to your drill-press fence so the screw-hole centerline is square to the table and aligned with the bit. Then, drill the counterbores.

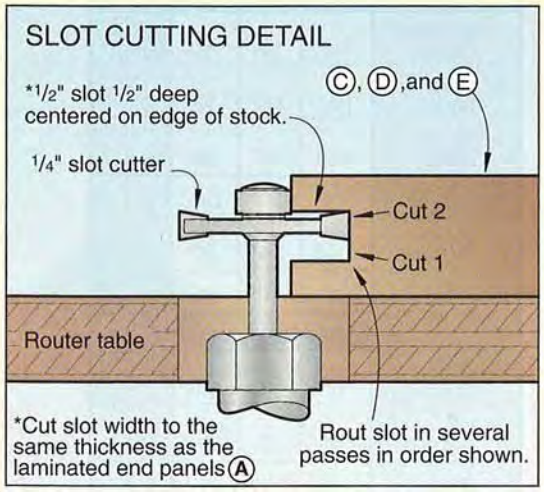
Now for the top rails, uprights, and center rails

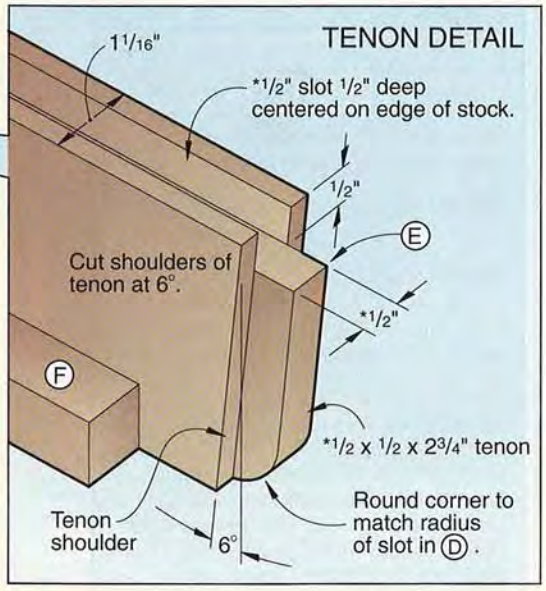
1 Cut the top-rail blanks (C) to the size listed in the Bill of Materials. Using the same procedure used to form the rockers (B), transfer the patterns, and cut and sand the top rails to shape. *As*

Continued

Sweet Dreams CRADLE


Ⓒ TOP RAIL
*1/2" slot 1/2" deep centered on bottom edge of top rail
*1/2" slot 1/2" deep
*1/2" slot 1/2" deep
Single-slot shelf hanger
Laminated end panel
*1/2 x 1/2 x 1" tenon
14 1/2"
Ⓐ END PANEL
15 3/8"
*1/2" slot 1/2" deep stopped where shown
1/2"
5/8"
1 1/2"
29 1/4"
Double-slot shelf hanger
#6 x 1/2" F.H. wood screws
#8 x 1 1/4" F.H. wood screw
Ⓕ
Ⓔ CENTER RAIL
See the Upright drawing for mortise sizes.
Ⓓ UPRIGHT
*1/2" slot 1/2" deep
Ⓓ
See the WOOD PATTERNS™ insert for shank hole sizes. Mating pilot hole is a 1/8" hole 2" deep into bottom of Ⓓ.
Ⓑ ROCKER
END FRAME
*Cut slot width and tenon thickness to the same thickness as the laminated end panels Ⓐ.
4" deck screws


SLOT CUTTING DETAIL
*1/2" slot 1/2" deep centered on edge of stock.
Ⓒ, Ⓓ, and Ⓔ
1/4" slot cutter
Cut 2
Cut 1
Router table
*Cut slot width to the same thickness as the laminated end panels Ⓐ
Rout slot in several passes in order shown.



shown on the pattern insert, don't cut the bottom corners to shape until after the slot is routed.

2 Carefully measure the thickness of the end panels (A). Measure precisely—the width of the slots and thickness of the tenons in the end-frame assemblies must be the same as the end-panel thickness.

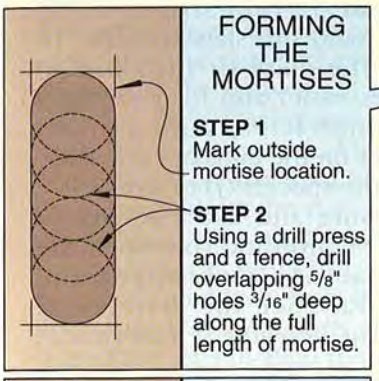
3 Secure a slot-cutting bit into your table-mounted router. Rout a ½"-deep slot centered along the *bottom* edge of each top rail as shown in Photo B. As shown on the Slot Cutting detail *above right*, make several passes to form a slot centered in the rail and equal in width to the thickness of the laminated plywood panel (A). Leave the router and bit setup; you'll use it again later. Now, finish bandsawing the bottom corners of the top rails to shape.

4 Cut the uprights (D) to size. Rout a ½"-deep slot 15⅜" long along the inside edge of each upright where shown on the End Frame and Upright drawings.

5 Using your tablesaw fitted with a dado blade and miter gauge, cut rabbets to form tenons on the top end of each upright.

6 Using the dimensions on the Upright drawing on the *opposite page*, mark the mortise locations on the inside face of each upright. Now, following the procedure listed on Forming the Mortises drawing, machine the mortises to house the shelf hangers.

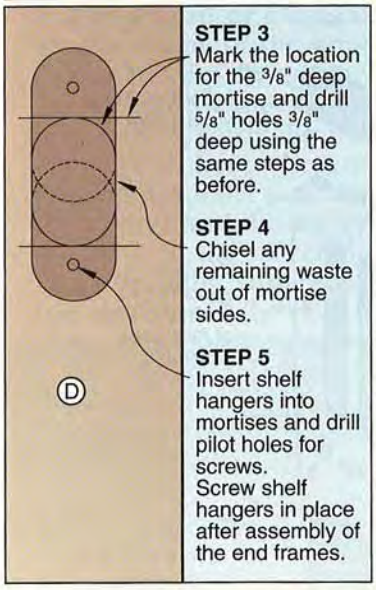
Rout a slot along the bottom edge of the top rail to fit the plywood panel. The guide stick clamped to the router table helps support the top rail.



FORMING THE MORTISES

STEP 1
Mark outside mortise location.

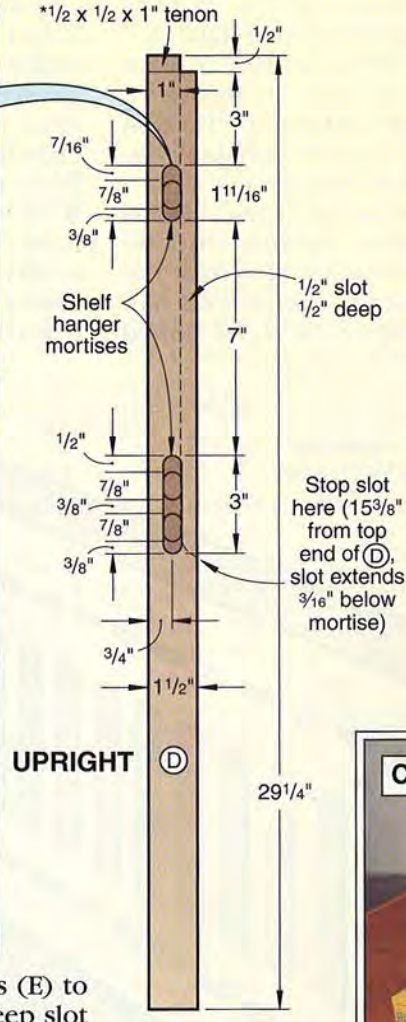
STEP 2
Using a drill press and a fence, drill overlapping 5/8" holes 3/16" deep along the full length of mortise.

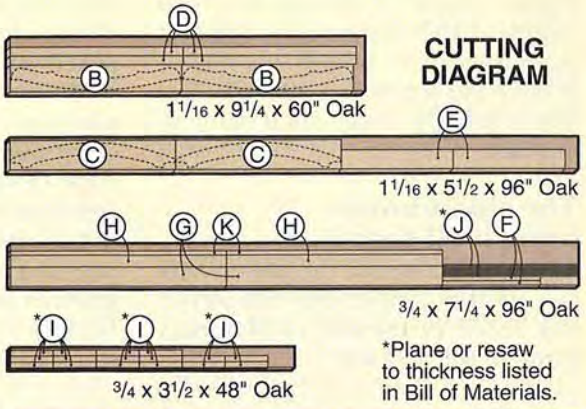


STEP 3
Mark the location for the 3/8" deep mortise and drill 5/8" holes 3/8" deep using the same steps as before.

STEP 4
Chisel any remaining waste out of mortise sides.

STEP 5
Insert shelf hangers into mortises and drill pilot holes for screws. Screw shelf hangers in place after assembly of the end frames.





CUTTING DIAGRAM

Dry-clamp each end frame to check for tight joints and proper fit before applying the glue.

7 Cut the center-rail blanks (E) to size (3¼×20"). Rout a ½"-deep slot along the *top edge* of each blank.

8 Transfer the center-rail pattern from the *WOOD PATTERNS™* insert to one of the center-rail blanks. Miter-cut both ends of each center rail at 6°.

9 Using your tablesaw fitted with a dado blade and a miter gauge angled to 6°, cut rabbets to form tenons on each end of each center rail. See the Tenon detail accompanying the End Frame drawing for reference. You want a snug fit of the center-rail tenons into the slots in the uprights. Round the bottom corners of each tenon to match the radius of the slot in the uprights.

10 Cut the cleats (F) to size. Drill four countersunk mounting holes in each for attaching to the center rails (E) later.

It's time to assemble the end frames

1 As shown in Photo C, dry-clamp (no glue) each end frame (except for the rockers and cleats) to check the fit. Adjust if necessary, and then glue and clamp each end frame together.

2 After the glue has dried, remove the clamps, and clamp a rocker (B) to the bottom of each end frame. Check that the joints between parts B and D are tight, trim if necessary. Using the previously drilled holes in the rockers as guides, drill ⅛" pilot holes into the bottom ends of the uprights. Remove the clamps and rockers from the bottoms of the uprights. Now, deepen the pilot holes in the bottoms of the uprights.

3 Glue and screw the rockers to the bottom of the uprights, using 4" deck screws.

4 Glue and screw the cleats (F) to the inside face of each rocker end

Continued

frame, flush with the bottom edges of the center rails (E) and centered side-to-side.

5 Drill the screw-mounting holes, and screw the metal shelf hangers in place.

The side frames bring it all together

1 Rip and crosscut the lower rails (G) and the upper rails (H) to the size listed in the Bill of Materials from ¾"-thick stock.

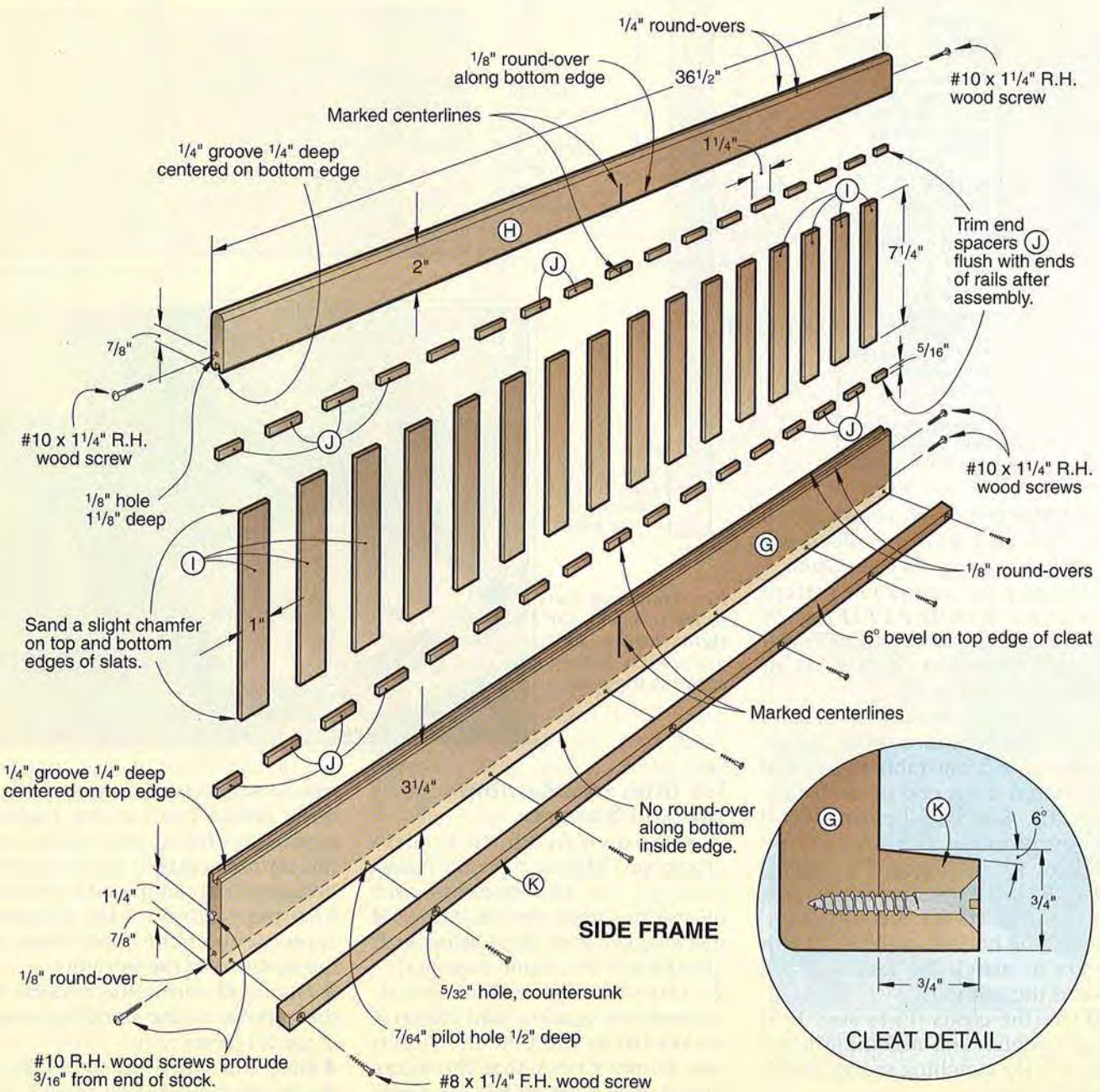
2 Rout ⅛" and ¼" round-overs along the edges of the rails as noted on the Side Frame drawing.

3 Mount a ¼" dado blade to your tablesaw, and cut a ¼" groove ¼" deep centered along the bottom edge of the top rail and along the top edge of the bottom rail.

4 Cut the slats (I) to size, checking that they fit into the ¼" grooves in the rails. (To make the ¼×1×7¼" slats, we planed oak stock to ¼" thick. Next, we ripped 1"-wide strips from the stock, and crosscut 32 thin strips to 7¼" long.) Sand the slats smooth. To make the slats fit into the ¼" grooves easier and for a stronger glue joint later, sand a slight chamfer on the ends of each slat.

5 Cut the spacers (J) to size.

6 Measure and use a square to mark a centerline (between the ends) across each upper and lower rail. See the Side Frame drawing *below* for reference.



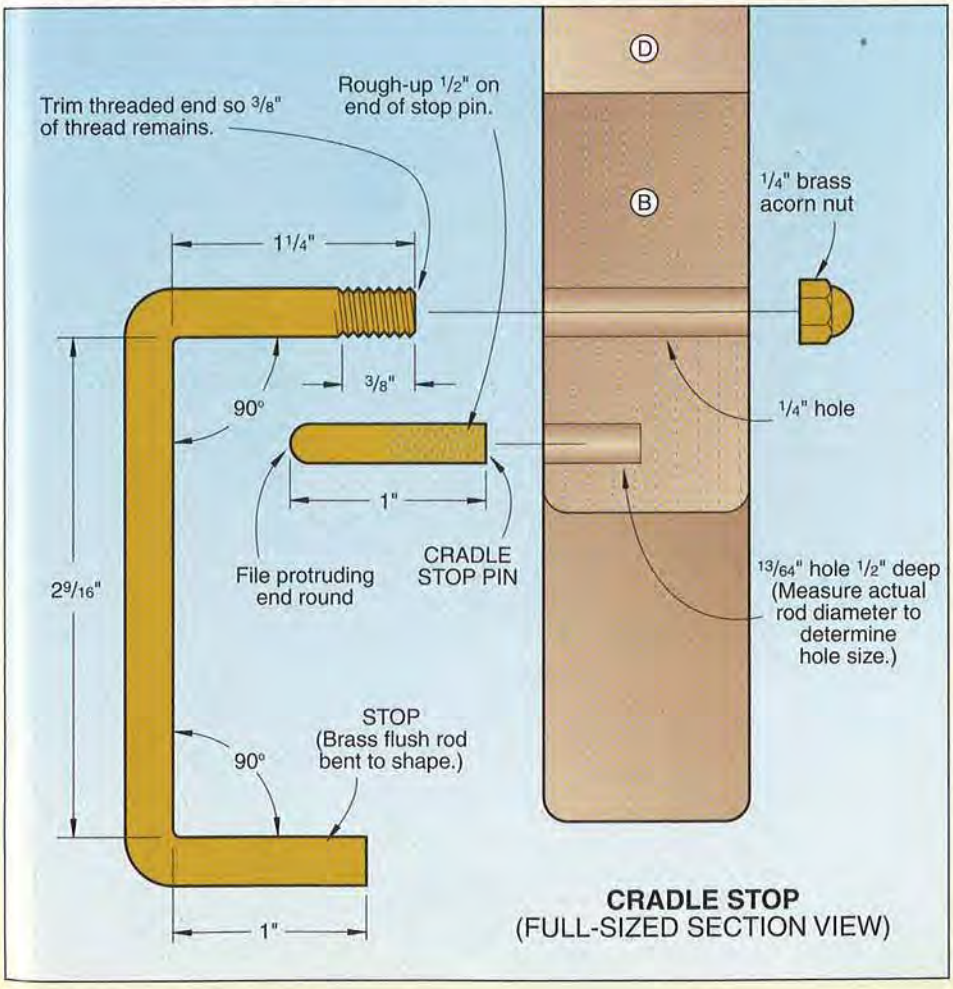
Then, mark a centerline down one face of four of the spacers.

7 Working from the center to the ends, glue the slats and spacers in position in the bottom rail, checking that each slat aligns square with the bottom rail. Align the centerlines on the spacers with those marked on the rails to start the process. (We used white glue for a longer working time.) Working quickly before the glue dries, clamp a scrap strip on each side of the slats to align them.

8 Run a bead of glue along the groove in one of the upper rails. Center the top rail on the center spacer, and fit the slats into the upper rail. Quickly flip the assembly over to keep the glue from running down the slats. Starting at the center and working toward the ends, fit the spacers in place. Use a framing square to check that the ends of the rails are flush with each other. Repeat this process with the second bottom rail. If your spacers fit a bit loose, use masking tape to hold them in place until the glue dries.

9 Cut the cleats (K) to size, bevel-ripping the *top* edge of each at 6° where shown on the Cleat detail accompanying the Side Frame drawing. Drill countersunk mounting holes, and glue and screw them flush with the bottom inside edge of each side frame.

10 Carefully mark the hole centerpoints on the ends of the rails (G, H) where dimensioned on the Side Frame drawing. *Then, position the ends of the side frames next to their mating location on the uprights (D), and verify that the marked centerpoints are centered against the openings in the metal shelf hangers.* Having verified the centerpoints, use an awl to make an indentation at each point. Drill ⅛" holes 1⅛" deep where indented. Drive a #10×1¼" roundhead wood screw into each hole, leaving the head to protrude 3/16" to fit into the slotted shelf hangers in the uprights. Check the fit of the side frames to the uprights, and adjust if necessary.



CRADLE STOP
(FULL-SIZED SECTION VIEW)

Add the bottom, the cradle stop, and then the finish

1 Connect the side frames to the cradle end frames. Measure the opening, and cut the bottom panel (L) to size.

2 To make the cradle stops, purchase two 12"-long brass float rods (used in a toilet tank). Use a hacksaw to cut a 5"-long section from *the end* of each rod. This will give you two 5"-long pieces each with a threaded end. Trim the threaded end of each rod section so that ⅜" of thread remains where shown on the Cradle Stop drawing *below left.*

3 Using your vise and a mallet, bend the stops (float rods) to the shape shown on the full-sized drawing. Trim the end opposite the threaded end to length on both stops.

4 From the remaining rod, cut two pieces to 1" long. You'll use these for the stop pins. File a round-over on one end of each and rough up ½" on the opposite end. Epoxy the stop pins in place in the 13/64" holes. Roughed-up, the end of the stop pin adheres better to the epoxy.

5 Slip the threaded end of the stops through the ¼" hole in each rocker. Add the acorn nuts to secure the stop to the rocker. Test the fit of the stops in the holes in the rockers. The stops should swing freely. Remove the stops.

6 Finish-sand the end frames, side frames, and bottom panel. Stain if desired (we left ours natural), and apply the finish (we used satin polyurethane). Attach the cradle stops with ¼" acorn nuts.

Written by Marlen Kemmet
Project Design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photographs: King Au; John Hetherington

HOW TO WORK WITH PLASTICS

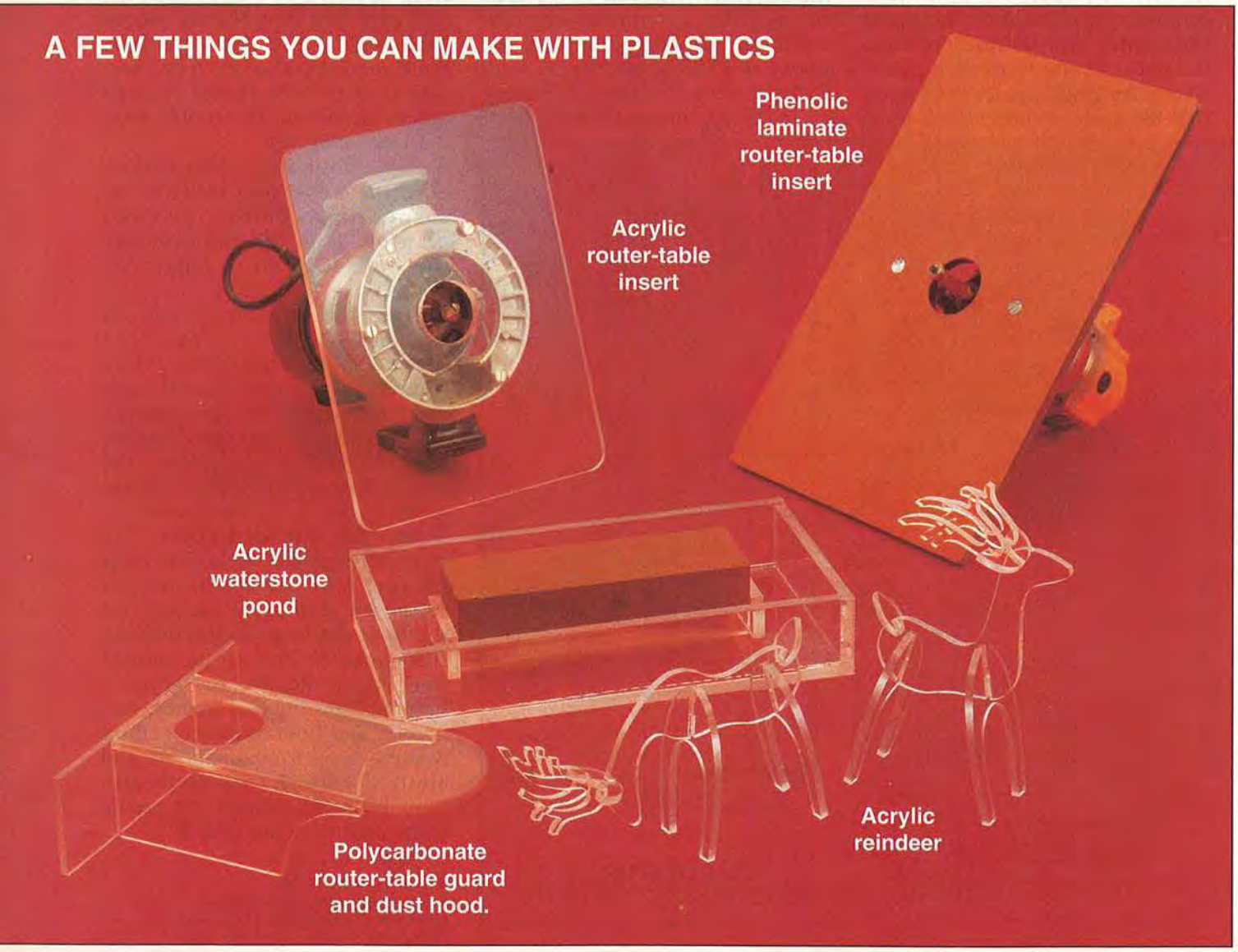
YOU ALREADY HAVE THE TOOLS; NOW HERE'S THE KNOW-HOW

Why should woodworkers be interested in plastics? Several reasons actually.

Once you learn some of the simple techniques presented here for working with plastics, you can make all sorts of objects that complement your woodworking. For inside the shop, build dust-collection hoods, miter-gauge slides, router-table inserts, and saw guards. For outside the shop, make trophy and display cases, clear shelving, plaques, and decorative cutouts like the acrylic reindeer in the photo *below.*

To get you started, we'll introduce you to the four different plastics every woodworker should know. Next, we'll show you how to cut, drill, join, and finish plastics with the skill of a professional. In most cases, the woodworking tools you already own will work well. And don't worry if you've never seen these plastics in your local lumber or hardware stores. On *page 65* we give you sources for everything you need. Now, let's get started.

A FEW THINGS YOU CAN MAKE WITH PLASTICS



WHAT'S WHAT IN PLASTICS

Acrylics

They're crystal-clear and rigid

Imagine what you could do with glass if it were practically unbreakable, easy to join, and safe to machine. In a nutshell, that describes acrylics.

Acrylic sheets come in thicknesses from ⅛" to 1". Some woodworking catalogs sell acrylic in 9×12" or 12×12" sizes for router-table inserts. You also can buy acrylic sheets up to 4×8' from plastic-supply outlets.

For router-table inserts, we recommend pieces that are ⅜–½" thick to resist sagging. And ¼"-thick acrylic works fine for most jigs and fixtures like dust hoods and machine guards. Acrylic also can serve you well as a router template material because its hard edges won't dent or groove under pressure from a pilot bearing.

In addition to clear, acrylic comes in a variety of translucent colors, and bronze and smoked tints. Expect to pay about $5.50 per square foot for ¼" material.

Polycarbonate

Tough and resilient, too

Polycarbonate looks just like acrylic. It comes in the same sizes and thicknesses, and you can fabricate the two with the same basic techniques. But polycarbonate rates as 300 times more impact-resistant than glass and 30 times more impact-resistant than acrylic.

You can use ¼"-thick polycarbonate anywhere you need a machine guard, especially as a shield over table-mounted router bits and tablesaw blades. And like acrylic, polycarbonate makes an excellent template material.

Polycarbonate's toughness comes at the expense of rigidity. Over time, polycarbonate will sag when carrying a load, making it unsuitable for router-table inserts or long spans. Prices for ¼" polycarbonate run about $7 per square foot.

On the bottom of a tablesaw cutoff jig, UHMW polyethylene slides like silk in the miter-gauge slot.

Phenolic laminate

Strong and abrasion-resistant

These opaque sheets come in four grades, but they are all made the same way—by applying heat and pressure to layers of paper or fabric that have been impregnated with a synthetic resin. Phenolic laminate offers more strength under load and abrasion resistance than acrylic or polycarbonate. This makes it ideal for router-table inserts that have to hold a heavy router, or in those situations where you work with rough stock that might scratch the surface of an acrylic sheet.

Rigid, scratch-resistant phenolic laminates make great router-table inserts.

We tried the canvas-grade phenolic laminate, as shown in the photo *below.* It machines easier than acrylic or polycarbonate, and over time it won't show scratches as the clear plastics will. This high performance comes at a higher price. A square foot of this material, ¼"-thick, costs about $8.

UHMW polyethylene

Slippery stuff for sliding jigs

UHMW (ultra-high molecular weight) polyethylene, shown in the photo *above*, offers two properties rarely found in one material. It is both abrasion-resistant, and slippery to the touch. These characteristics make it ideal for guide strips that ride in the miter slots in tablesaws and other machine tops. This white, lightweight plastic won't expand and bind in a slot like wood, and it will last for decades, even under constant use.

You won't get any structural or load-bearing strength from UHMW polyethylene, but it holds screws well, so you can fasten it securely to other materials. This low-friction plastic comes in sheets of various thicknesses as well as rolls of adhesive-backed tapes. The tape makes a good lining for jigs or tablesaw and router-table fences where metal-to-metal or wood-to-metal friction can hinder the movement of a workpiece.

The cost for adhesive-backed UHMW polyethylene tape runs about $1 a yard in 1" widths. Sheets in ¼" thickness cost about $5.60 per square foot.

Continued

HOW TO MACHINE PLASTICS
Guidelines for foolproof results

With Tablesaws
More teeth are better

You can cut any of the above-mentioned plastics with any saw that cuts wood, but for the best results use a tablesaw or radial-arm saw with a 10" carbide-tipped blade having 50-60 teeth, a triple-chip tooth design, and a positive rake angle of 5-10°.

Avoid ripping blades, combination blades, and blades with aggressive hook angles. These will cause chipping and may grab the plastic sheet, resulting in kickback. When tablesawing plastics, watch your feed rate carefully. If you go too fast, you'll experience some chipping. If you go too slow, the plastic may melt and cause kickback. Leave the adhesive-backed paper wrapper on your plastic sheets during sawing or any machining operation. This protects the plastic from scratches and gives you a surface on which to draw lines.

With Bandsaws and Scrollsaws
Good for roughing out shapes

Bandsaws work well when you cut curves or rough-out a shape. Run the saw at 2,500-7,500 feet per minute. The thicker your material, the higher speed you should run. Use blades with 10-14 teeth per inch (tpi).

Scrollsaws do a fair job of cutting plastics, although the short cutting stroke allows plastic grit to build up and bind in the kerf. Sheets thicker than ¼" tend to overheat scrollsaw blades, melt the plastic, and bind the blades. With scrollsaws, use a coarse cut blade with 10-14 tpi.

A router with a piloted straight bit cuts a clean edge around a template.

With Jigsaws
Keep your piece clamped tight

If you don't have any other means of cutting plastic, a jigsaw can be used, although it is the least desirable method. Use a metal-cutting blade with about 10 tpi, avoid the saw's orbital settings, and make sure the jigsaw is going full speed before entering the sheet.

The rough motion of a reciprocating blade can vibrate the entire workpiece and cause chipping on the cut line and cracks or crazing elsewhere in the sheet. To prevent this, clamp the workpiece firmly to your bench. Use a wide board (1×6" or so) as a hold-down and as a straightedge to guide the baseplate of the saw. The cut line should extend no more than 1" beyond the support underneath it.

Routing Strategies
Straight bits leave clean edges

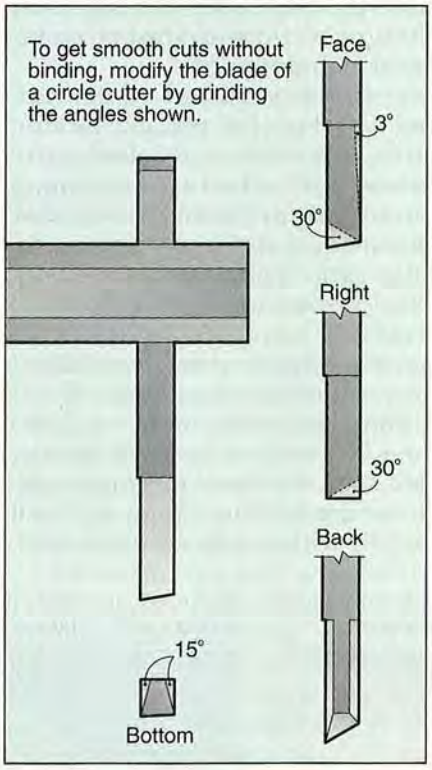
Of all the machining operations, routing provides the best quality finished edge on plastics. You'll get the smoothest results by rough-cutting the sheet ⅛" larger than the finished size and then routing the edges to the finished size with a spiral bit or two-flute straight bit. Use a straightedge or template, and a piloted bit, as shown in the photo *left* to guide the router. If you have a variable-speed router, use the highest speed, typically 20,000 rpm.

Drilling Tips
Modified bits prevent mishaps

Twist-type drill bits work best on plastic, but they tend to grab the material, especially near the exit point. To avoid this, file a small

Filing a small flat on the cutting edge prevents drill bits from grabbing at the plastic.

With the shaft in the hole, the cutter can scribe a smooth circle.



flat, about ⅛"-wide on the cutting edges, as shown in the photo *top*. If you don't want to modify your bits, you can buy special drill bits for plastic where most plastic sheets are sold.

When you drill a hole three times deeper than the diameter of the bit, use a drill press to steady the bit, and lubricate the bit with paraffin to remove chips and improve the finish. For cutting larger holes in plastic, use a circle cutter mounted in a drill press, and modify the tip of the cutter by grinding the cutting angles as shown in the illustration *above*. If your circle cutter comes with a shaft rather than a drill bit in the center, drill a guide hole for the shaft of the circle cutter in the center of the workpiece. Insert the shaft in this hole before starting your cut. As shown in the photo *above left*, the guide hole acts as a bearing for the shaft and reduces the amount of wobble in the cutter.

Continued

HOW TO KEEP DUST AND GRIT AT BAY

On acrylics and polycarbonates, static electricity attracts dust and grit that may scratch the surface of the sheet. Manufacturers make a variety of antistatic treatments, but you can defeat this problem yourself by wiping the sheet with a damp cloth and patting it dry. The best way to clean plastic is to wash it gently with a mild solution of dishwashing detergent and a soft cloth, sponge, or chamois.

GUARD AGAINST SHRINKING AND SWELLING

Even though they seem stable, acrylic and polycarbonate expand and contract up to 1/16" per foot over a 50-degree change in temperature. On close-fitting components like router-table inserts, be careful not to size your plastic part so tightly that it can't be removed later. The expansion rates of UHMW polyethylene and phenolics are not large enough to affect most shop or woodworking applications.

FUMES AND GRIT

Protect yourself and your tools

Machining any of these plastics will release some fumes into the air, including a methyl methacrylate monomer. These fumes may cause eye or respiratory irritation, nausea, or headaches. To prevent these problems, work in a well-ventilated area. If you intend to do a lot of machining at one time, wear a respirator with an organic vapor cartridge.

Airborne dust isn't a problem with these plastics since the machined particles are large and heavy. You should, however, take care to prevent the buildup of plastic grit and debris inside your machinery, by thoroughly blowing out plastic particles. This debris can shorten the life of your bearings and clog or interfere with moving parts.

THREE WAYS TO FINISH PLASTIC EDGES

The machined edges of acrylic, polycarbonate, and phenolics usually need smoothing after they've been cut. There are three ways to accomplish this: scraping, buffing, and flame polishing. The last two edge treatments are usually reserved for projects such as trophy cases, jewelry boxes, and other showpieces that look better with a clear, polished edge.

Scraping

For a fast, matte edge

The easiest way to remove saw marks is to scrape the edges with a straight, blunt steel edge such as the unsharpened end of a cabinet scraper. This produces a clean, frosted finish.

Prior to scraping, secure the workpiece in a vise padded with a soft cloth. Hold the scraper about 20° from vertical, as shown in the photo *below left*, and bear down with hard, fast strokes. When you're done scraping, you'll have sharp corners on the edges that you can knock off by scraping a small bevel, as shown in the photo *below right*.

If you are preparing the workpiece for a decorative item, you may want to peel off only that portion of the paper where you need to work. Since a small scratch won't affect the performance of a shop fixture, we found it easier just to peel off the entire wrapping during the beveling stage, as shown in the photo *below right*.

Buffing

Slow but controllable

The first stage in buffing is to scrape the edge of the plastic to remove saw or tool marks. Then, sand the edge with 320- and then 400-grit wet/dry sandpaper moistened with water.

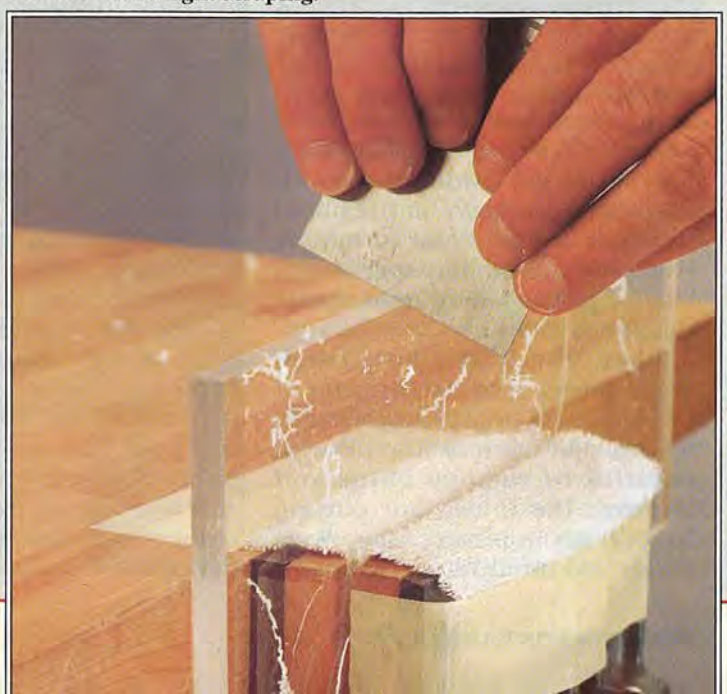
Next, chuck a felt or muslin buffing wheel in your portable electric drill, as shown *right*. Dress the wheel with a buffing compound such as those made for silver or brass, or car polishing compounds. (But avoid compounds that contain silicone or cleaning agents.) You also can use wood polishes such as tripoli, or buy specialized plastic buffing compounds.

Run your buffing wheel at 3,000 to 4,500 surface feet per minute, and keep the wheel moving to prevent heat build-up. Apply the final polish with a soft cotton wheel.

Buffing a scraped edge produces a smooth, clear finish.

The blunt end of a cabinet scraper puts a smooth finish on the rough edges of acrylics and polycarbonates.

To finish cleaning up an edge, remove any small burrs on the corners with a light scraping.



A FEW TIPS ON JOINING AND FASTENING PLASTICS

When you join two pieces of acrylic or polycarbonate with the proper solvent-based cements, you create a joint that is stronger than the material itself. The methelyne-chloride-based solvents used to join acrylic and polycarbonate dissolve the material on the edges and recombine them into a single, welded, waterproof piece. UHMW polyethylene and phenolics, however, cannot be cemented together and must be mechanically fastened with screws.

To start the solvent-joining process, scrape the saw marks off the edge to be joined and butt the pieces together. Keep the joint line horizontal to prevent the solvent from dripping out of the joint. Use a glue syringe to inject the solvent into the joint, as shown *right*, but don't force solvent into the joint. Capillary action will draw the solvent out of the syringe and into the gap, and the bond will set up within about 20 minutes. If you squeeze too much solvent out of the syringe, it will puddle and smear the surrounding surfaces.

To secure the two workpieces during this operation, build a right-angle clamping jig out of particleboard sized to fit the dimensions of your project. A bright work light placed near the joint helps you see the solvent being drawn into the joint and prevents you from overfilling or starving the joint.

All of these plastics can be tapped to hold screws, but on acrylic, lubricate the tap with paraffin to prevent chipping the edges of the threads. For machine screws that will be frequently removed, consider using a threaded insert. Whenever you tighten a round-head screw into a piece of plastic, use a rubber or nylon washer under the screw head, and apply gentle pressure so you don't crack the plastic.

Capillary action draws the glue out of the syringe and into the joint.

WHERE TO BUY PLASTICS AND SUPPLIES

Many home centers and hardware stores carry sheets of acrylic and a limited selection of solvents and drill bits. You'll find a better selection of materials and tools, though, if you check in the local Yellow Pages under "plastics."

If your Yellow-Pages search doesn't turn up any prospects, contact United States Plastic Corp., 1390 Neubrecht Rd., Lima, OH 45801. Call: 800/537-9724. This mail-order firm carries everything mentioned in this article and will process any order over $5.

Flame polishing

Tricky but quick

Manufacturers do not recommend this technique, but many fabricators flame polish plastic edges because the procedure is simple and fast. The problem with flame polishing is that it can cause crazing on the surface of the sheet, and this may not show up until weeks after the piece has been polished. If you are careful not to overheat the plastic, flame polishing produces a crystal-clear edge faster than any other method.

Light a propane torch and position the tip so that the blue inner cone of flame just touches the edge of the plastic as shown *below*. Move the flame back and forth across a small area several times, watching carefully for signs of distortion or burning. The object is to apply only enough heat to melt the rough edges and form a clear, smooth finish. Use only on acrylic and polycarbonate plastics.

Flame polishing requires careful control to avoid damaging the plastic.

Written by Tom Jackson
Photographs: King Au
Technical consultant: Dave Wiles, Van Horn Plastics
Illustration: Roxanne LeMoine

Turn them two at a time HANDY, DANDY

Tired of propping doors open with bricks or books? If so, just turn a few of these mansion-quality doorstops—we'll show you how to make two at a time. Then, you can stand doors open stylishly.

Project prep

Stock: 1½×1½×9¼" Hardwood. Each piece this size yields two doorstops.
Lathe equipment: Cup-type dead center, live tail center.
Turning tools: ½" and 1" skew, ¼" and ¾" bowl or spindle gouge, parting tool.
Lathe speeds: Roughing and sanding, 1000–1200 rpm; finish turning, 1200–1500 rpm.

Start with a piece of stock 1½×1½×9¼" (oak shown). Plane or sand the faces flat, smooth, and square to each other. Ordinarily, you don't need to be concerned about the faces on a turning blank, but most of this one won't be turned—it will remain square.

Locate and mark the center on each end of the blank. To find the center accurately, draw diagonal lines on each end—they cross at the center. Using a try square and a pencil with soft lead, draw dark lines across one face of the blank, 1⅞" from each end. Draw another line ½" inside each of those.

Mount the blank between centers on your lathe. At the drive (headstock) end, install a cup-style dead center, the type often furnished with a lathe as the tail center shown in *Photo 1 below*. Use a rotating (live) tail center.

Round the ends to start

Using a ¾" spindle or bowl gouge, turn the 1⅞"-long section at each end of the blank to 1⅛" diameter, leaving the 5½"-long midsection of the blank square. Begin the transition from square to round at the line nearest each end, as shown in *Photo 2*. Then round the blank from the line out to the end.

Next, square each shoulder (where the round end meets the midsection) to the line. The 1" skew easily handles this chore. Lots of turners are leary of the skew, but the dead-center drive employed here makes it less likely that you'll do any serious damage by misusing a tool. If you snag the tool, the turning simply stops going around.

To skew-cut the shoulders, stand the tool on edge on the tool rest, long point down. Angle the skew to place the bevel that faces into the blank perpendicular to the side of the blank, as shown in *Photo 3*. Taking light cuts, square the shoulder to the first line at each end.

Taper the round sections to 1⅛" diameter at the shoulder. With the skew, undercut the base of each

Install a dead (nonrotating) cup center in the headstock. This way, tool catches are less likely to damage the turning.

Turn the ends round from the outer line outward. If the turning stops too easily, increase the tailstock pressure.

Square the shoulder with a skew before rough-turning the handles. Cut to the outermost line.

DOORSTOPS

round end. (The ends should now look like the rough-turned handle on the Full-Sized Template).

Shape the handles

Next, round over the shoulders. Starting from the line ½" inside the shoulder, make a rolling cut down to the face of the shoulder. You can do this with either a skew or a gouge. Cutting from the line down to the face helps prevent splintering at the corners.

To make the cut, start with the tool in position for a normal round-surface cut at the line. Near the line, you'll be cutting away corners in an interrupted cut. Then, move the tool toward the end of the blank, rolling it at the same time, as if cutting a bead, as shown in *Photo 4*. The tool should describe an arc rather than a straight line.

After forming the shoulders, turn the knobs. Lay out guidelines on each rough-turned handle, then shape the knob with a small gouge and skew, as shown in *Photo 5*. At the end of the handle (¼" from the end of the blank), cut in with the parting tool to about ¾" diameter. Shape the end of the knob as far as you can without parting off the supporting tenons. Sand the handles with 150- and 220-grit sandpaper.

Make the two decorative grooves where shown. A parting tool laid on its side or the tip of your skew will make a suitable V-shaped cut. To make the grooves show up better, burn them in. Here's how:

Cut a 12"-length of 18-gauge steel or copper wire (or any other size that fits into the grooves you've cut). Secure each end to a dowel or stick suitable for a grip, leaving 5" or 6" of wire between the handles. With the lathe running, stretch the wire, and press it into each groove, holding it until friction burns the wood.

Now, complete the knobs. Shape the ends, working on them alternately until you have just two small cones supporting the turning. Remove the turning from the lathe, and trim the waste ends off.

Cut the turning in two

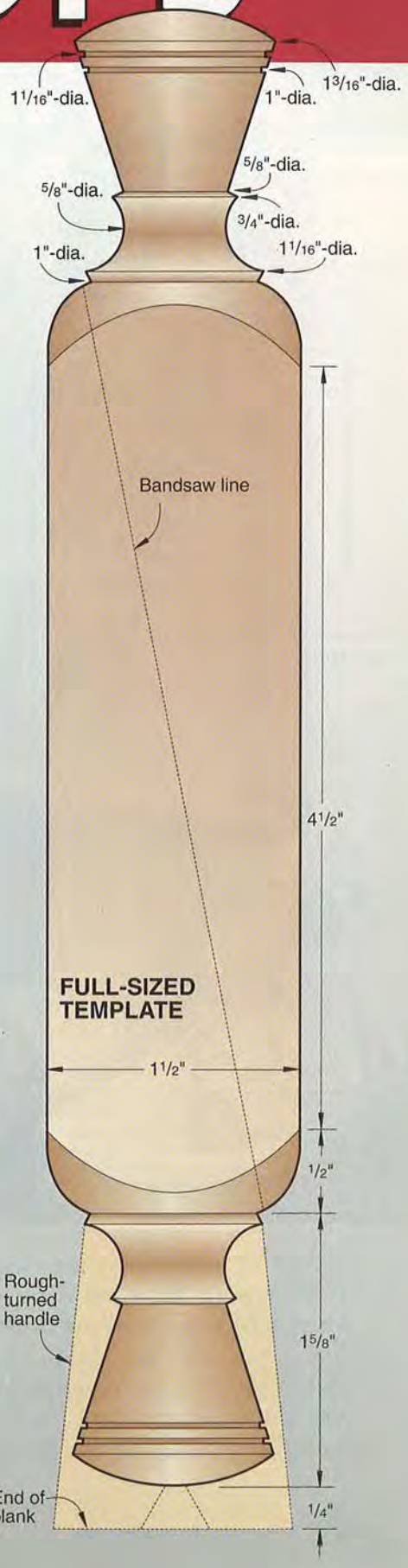
Draw a diagonal line across one face of the square section, as shown on the Full-Sized Template. Bandsaw the turning in half along the line. Sand the wedge, removing the saw marks and rounding the corners slightly. Sand the handle ends.

Stain or apply a clear finish, as you prefer. The doorstop will be subject to a lot of scuffing, so put on a final coat of semi-gloss polyurethane for protection.

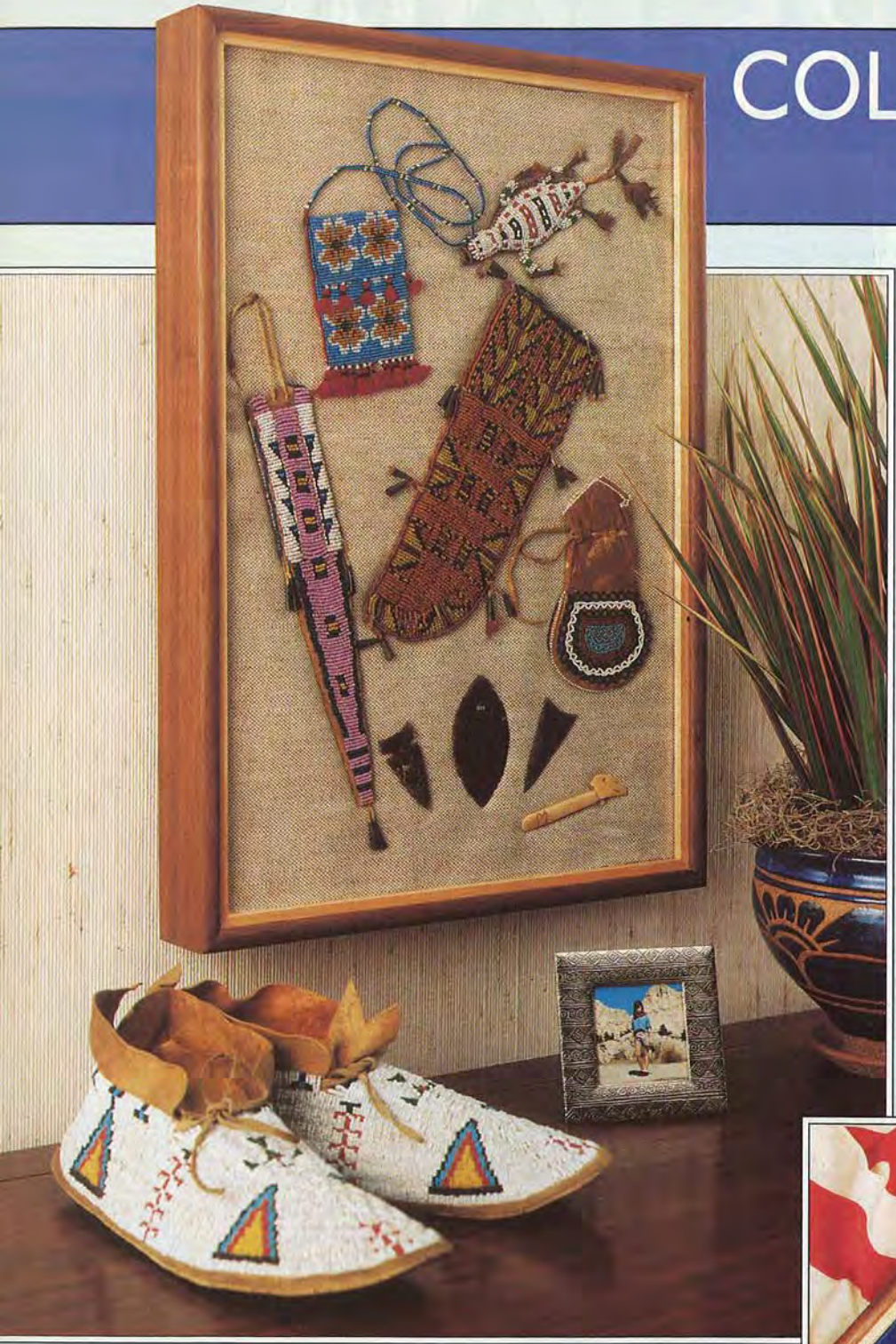
Project Design: Dick Sing
Photographs: John Hetherington
Illustration: Roxanne LeMoine

When rounding the shoulders, cut away from the line to prevent splintered corners.

Guidelines drawn on the turning will help you position the knob features. Check the template as you work.



COLLECTOR'S-SPECIAL



Attention collectors! We dedicate this project to all of you who have trouble finding a display case worthy of your favorite collectibles. We think you'll agree that ours get the job done in a way that guarantees top billing for your prized collection. And do you know something else? The cases couldn't be easier to build.

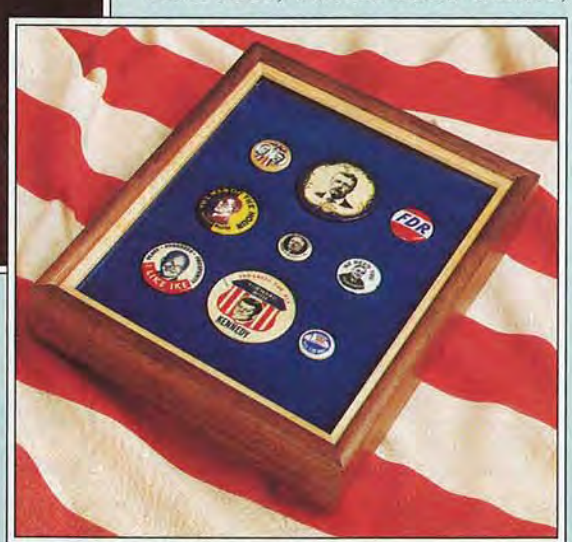
Note: *The machining and construction of the tabletop and wall-hung display cases are nearly identical, other than the overall size of the projects. Use the directions here to build either project. Or, lay out your collection on a flat surface, and build a case to fit the size you need.*

Start with the frame molding and glass stops

1 From ½" stock (we used walnut), rip enough lineal strips to 2⅛" wide for the frame ends (A) and sides (B). (We cut our pieces extra long to allow for waste on each end when machining in the following steps. We also cut an extra strip about 10" long for use as a test piece when adjusting the dado blades and router bit in the three-step Machining the Frame Molding drawing.)

2 Using Step 1 on the three-step drawing for reference, fit your tablesaw with a dado set and auxiliary fence. Then, cut a ⅜" rabbet ½" deep along the bottom inside edge of each piece of frame stock.

3 Using Step 2 of the drawing for reference, switch dado blades,



DISPLAY CASES

and cut a ¼" dado for the glass stops where dimensioned.

4 As shown in Step 3 of the drawing, use your router fitted with a ⅜" round-over bit to rout partial round-overs along the top edge of each frame member (A, B).

5 Cut the glass stops C and D to ¼×⅜" and to the same lengths as the frame members.

6 Glue the stops into the frame members A and B, using the glue sparingly to avoid excess squeeze-out. Use a damp cloth to wipe off the excess glue. See the Frame Assembly drawing for reference. (We used spring clamps to hold the glass stops in place. These clamps are easy to remove when wiping off the excess glue.)

Miter-cut and assemble the frame

1 Miter-cut two pieces of scrap, hold them together, and check with a square to verify accurate 45° angles. Adjust the miter setting if necessary. Now, miter-cut the frame members A/C and B/D to the lengths listed in the Bill of Materials. (To minimize splintering the glass stops when mitering, we wrapped masking tape around them to support the fibers when making the cut.)

2 Position the four frame pieces inside facedown on a flat surface, with the mitered ends butted together. Keeping the top and bottom edges aligned, use masking tape to tape the pieces together end-to-end. Cover the entire joint with the tape. The tape will prevent squeeze-out on the outside surface of each joint. Unfold the frame and apply glue to the miters. Refold the pieces and tape the mating corners. Check for square. Wipe off the excess glue with a damp cloth.

3 Measure the rabbeted opening, and cut the ½"-thick plywood back (E) to size. Drill countersunk mounting holes, and secure the back to the frame with #6×1" flathead wood screws.

4 For the tabletop display case shown on the inset photo on the *opposite page*, add four rubber feet to the bottom of the case. For the wall-hung case, remove the plywood back and rout keyhole slots in the back. Use a plunge

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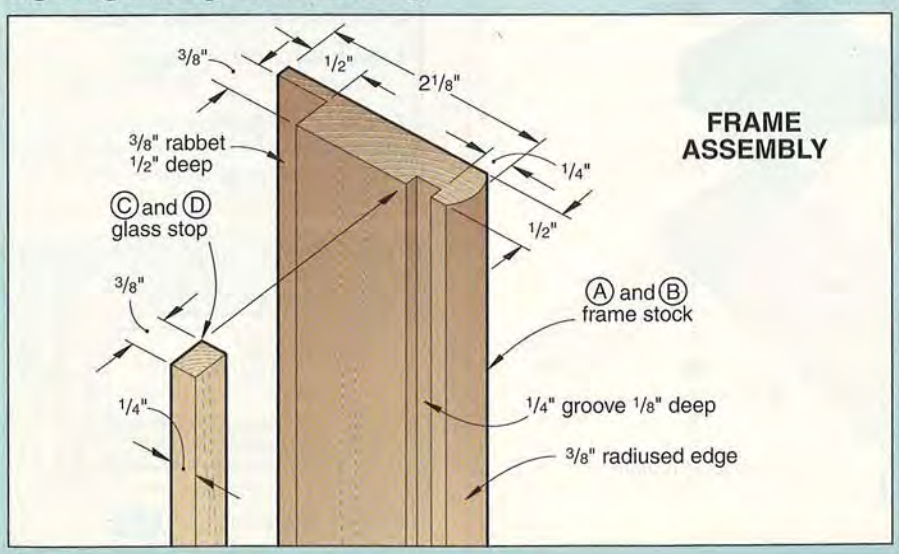
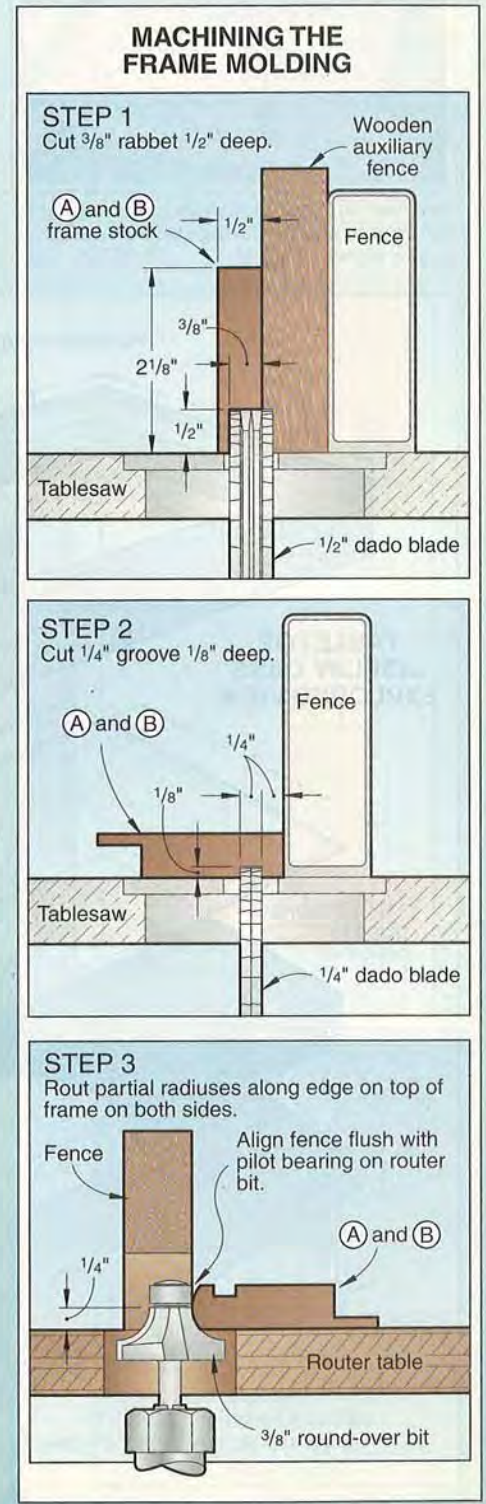




DISPLAY CASES

Use end and top guides to guide and stop the router when routing the keyhole slots in the plywood back.

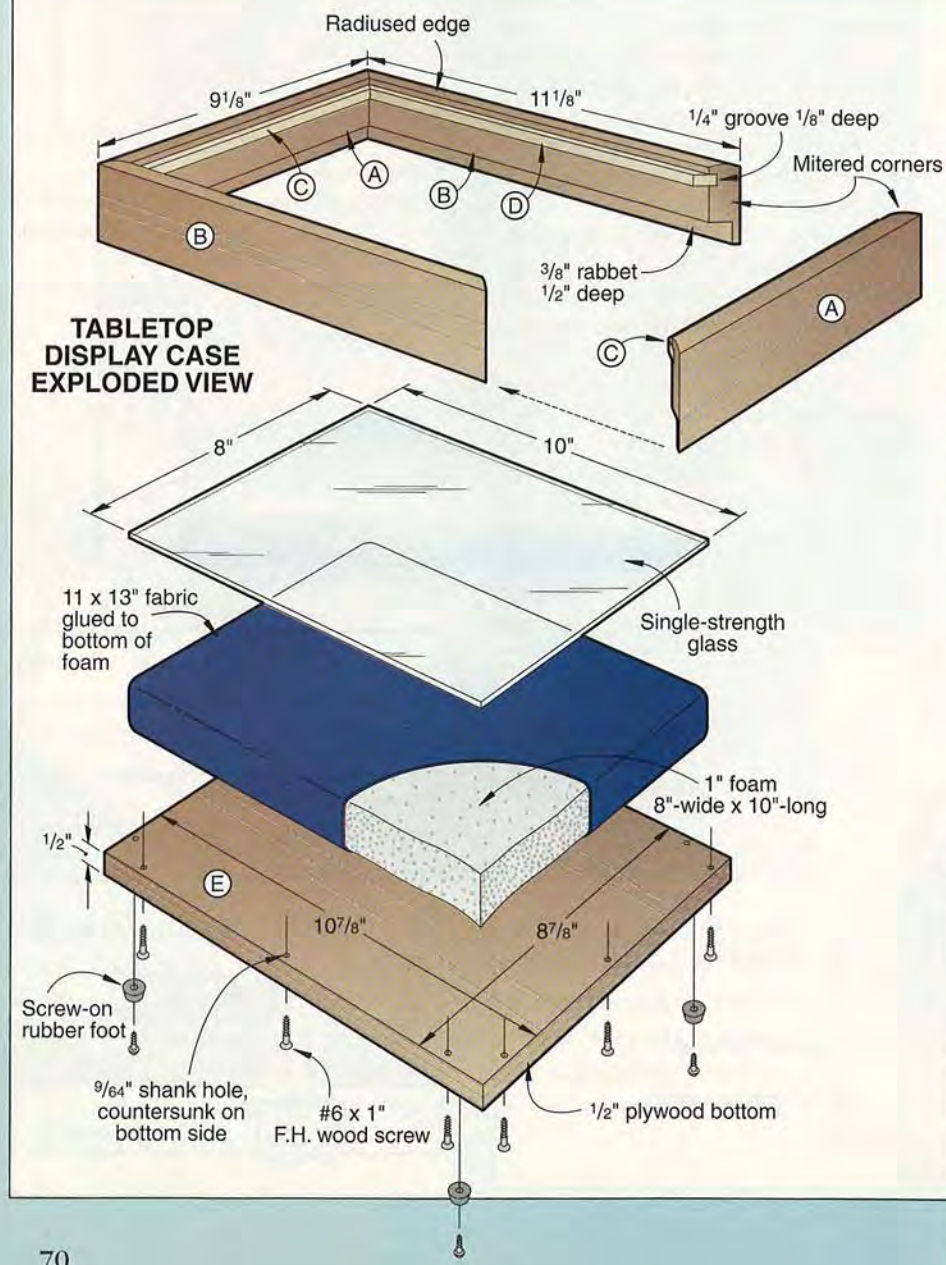
router fitted with a keyhole bit. See the photo *at left* for our setup to do this. (As shown in the photo, we constructed guides to guide the router for straight cuts.)

Sand, apply the finish, and add the collectibles

1 Finish-sand the frame. Apply a clear finish (we used Minwax Antique Oil Finish, following the directions on the can and rubbing lightly between coats with 0000 steel wool).

2 Have a piece of single-strength glass cut to fit the opening. Secure it in place with a couple drops of clear silicone sealant.

3 To display objects against the glass, cut a piece of 1"-thick poly foam to fit inside the frame. (We cut the foam piece for our tabletop case on the bandsaw using the fence for a guide. For the wall-hung case where the foam can be too large to cut on the bandsaw, we used a metal straight-edge and utility knife. To do this, we



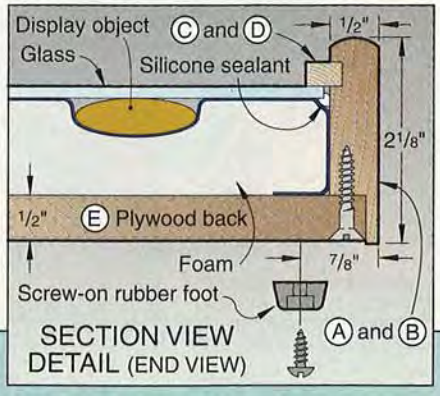
Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
TABLETOP DISPLAY CASE					
A* ends	½"	2⅛"	9⅛"	W	2
B* sides	½"	2⅛"	11⅛"	W	2
C* end stops	¼"	⅜"	8⅜"	M	2
D* side stops	¼"	⅜"	10⅜"	M	2
E back	½"	8⅞"	10⅞"	BP	1
WALL-HUNG DISPLAY CASE					
A* ends	½"	2⅛"	15⅛"	W	2
B* sides	½"	2⅛"	21⅛"	W	2
C* end stops	¼"	⅜"	14⅜"	M	2
D* side stops	¼"	⅜"	20⅜"	M	2
E back	½"	14⅞"	20⅞"	BP	1

*Initially cut parts marked with an *oversized. Trim to finished size according to the instructions.

Materials Key: W–walnut, M–maple, BP–birch plywood

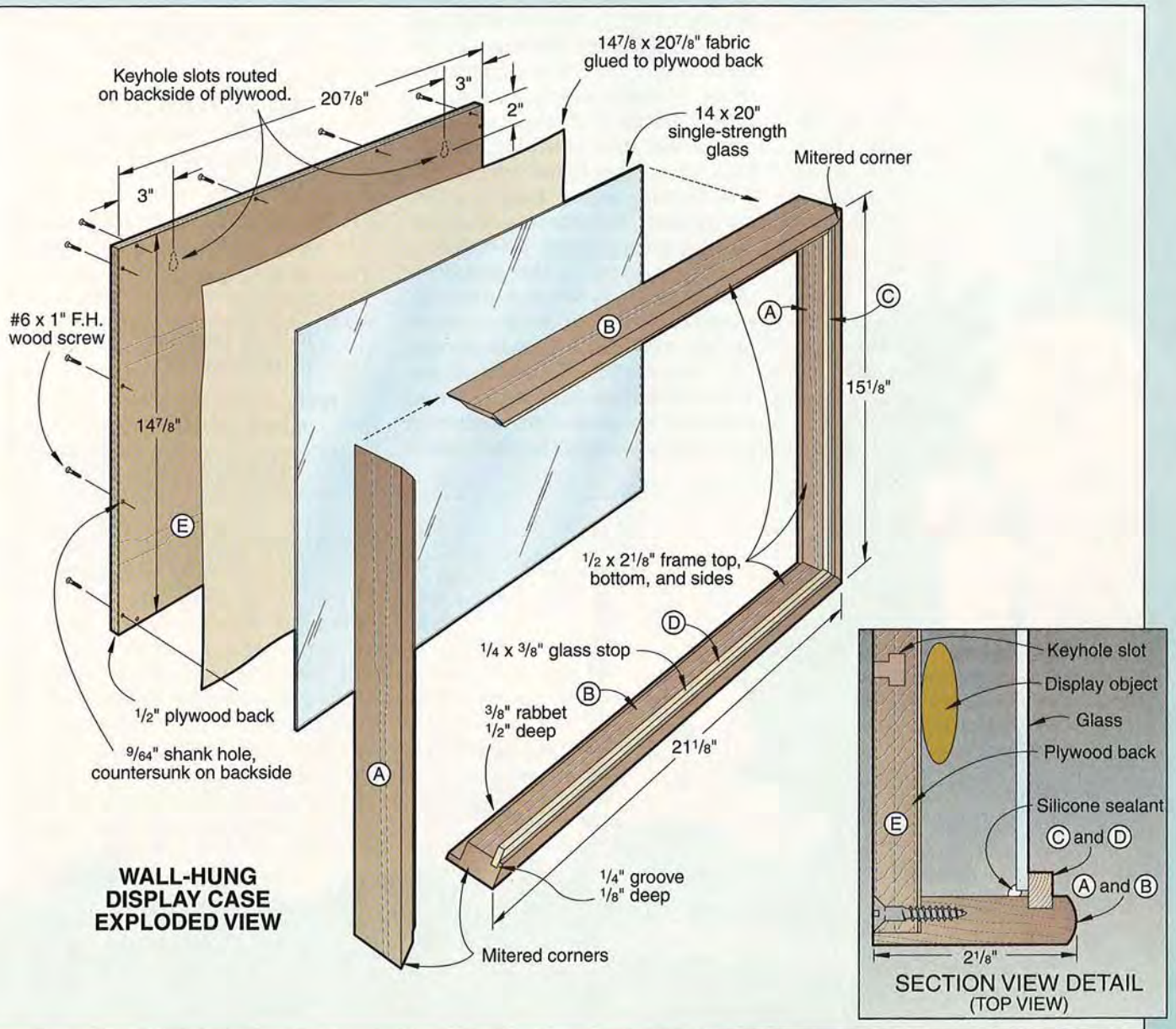
Supplies: ⅛" single-strength glass, clear silicone sealant, 1"-thick poly foam, #6x1" flathead wood screws, screw-on or self-adhesive rubber feet for tabletop version, fabric, clear finish.



pushed the straightedge against the foam to compress it, and then used the knife to trim the foam, running the blade against the metal straightedge.)

4 Cover the foam with a fabric of your choice, and secure the back of the fabric to the foam with spray adhesive. Place the frame with glass installed facedown on a flat surface, and arrange the objects to be displayed facedown on the glass. Carefully insert the fabric-covered foam, and then fasten the plywood back with #6 screws. Turn the case over.

5 To display objects mounted to the back of the case, cover the plywood back with fabric, fastening the fabric to the front surface and edges with spray adhesive. Mount the objects to the fabric. The method of mounting will depend on the objects being displayed. *Note that the plywood back (E) does have a top and bottom edge, depending on where you routed your keyhole slots. By mistake, we mounted our display pieces to the backboard, only to turn it over and realize that the keyhole slots were at the bottom rather than top edge of the back.* Place the frame with glass installed facedown on a flat surface. Insert the plywood back, with objects attached, into the rabbeted opening in the frame, and secure with the #6 screws. Turn the frame over and hang it in a prominent place for all to see and enjoy.



CARVE SOME COMIC RELIEF CARTOON

Relief carving meets cartooning in this terrific caricature. Even if you're a newcomer to carving, you'll find this one as much fun to carve as it is to look at.

SEE THE *WOOD PATTERNS™* INSERT FOR FULL-SIZED PATTERNS

"I had the worst time carving figures; I couldn't get the eyes on straight," Larry Green jokes as he recounts his early attempts at carving caricatures. Whether or not fear of uneven eyes really turned him to side views, the Knoxville, Tennessee, carver has taken to them in a big way.

In collaboration with artist and cartoonist Mike Altman ("I can't draw, and Mike isn't a very good woodcarver!"), he's created hundreds of different side-view caricatures. Larry carves his characters from ¾"-thick stock, employing relief-carving techniques to trick observers into thinking they're looking at a 3-D figure.

To begin carving Larry's proud carpenter, photocopy the full-sized pattern in the *WOOD PATTERNS™* insert in the middle of the magazine. With a piece of transfer paper or carbon paper facedown beneath it, tape the pattern to a ¾×5½×9" piece of basswood, and trace it onto the wood. A French curve and a straightedge will help you keep the lines sharp.

(You can enlarge or reduce the pattern if you wish, and carve it on thicker or thinner stock, as appropriate. Larry carved the 14"-tall one shown *below left* from 1¾"- thick stock. The how-to photos show a pattern-sized carving.) Bandsaw or scrollsaw around the outer pattern line.

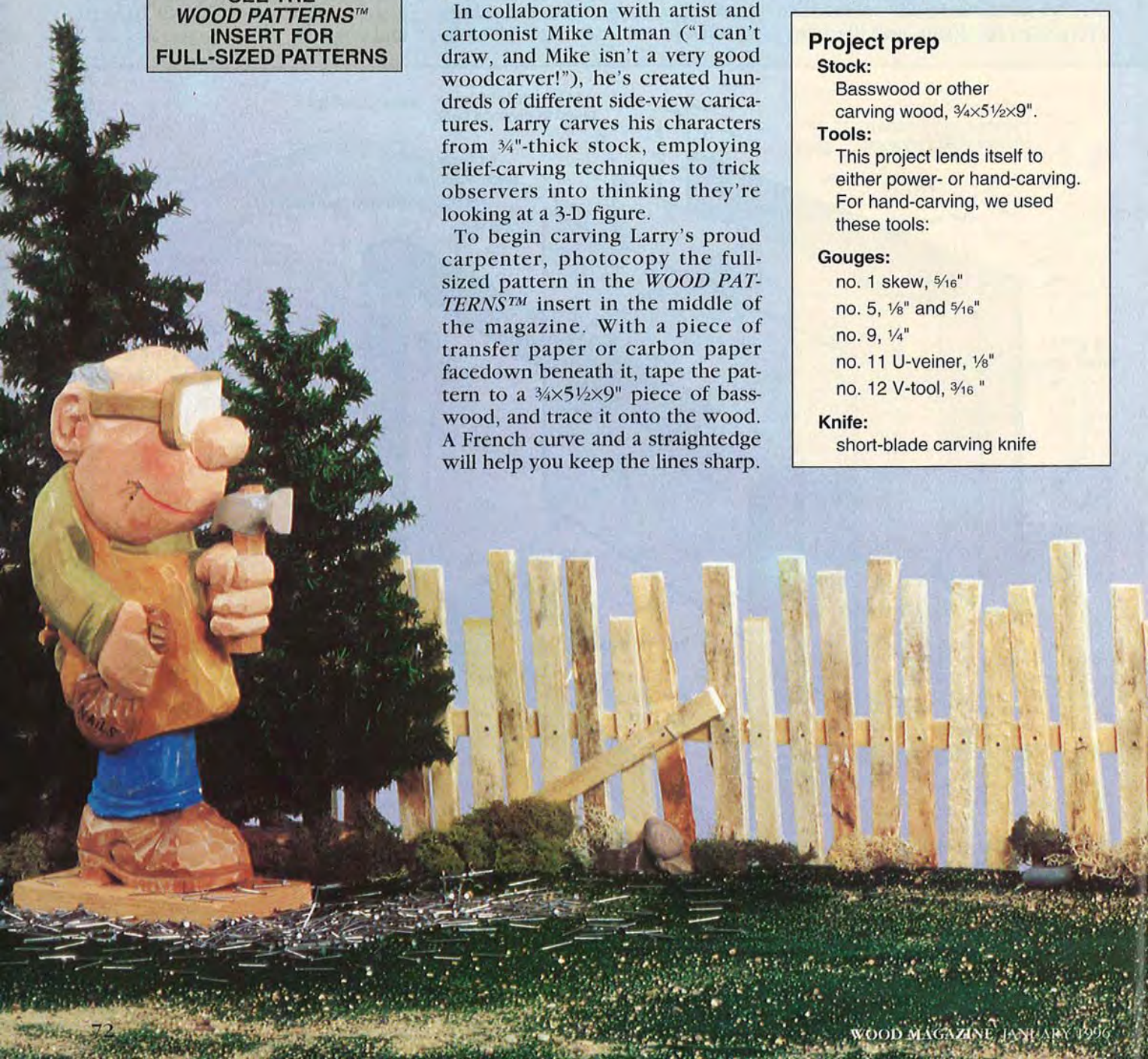
Project prep

Stock:
Basswood or other carving wood, ¾×5½×9".

Tools:
This project lends itself to either power- or hand-carving. For hand-carving, we used these tools:

Gouges:
no. 1 skew, 5/16"
no. 5, 1/8" and 5/16"
no. 9, 1/4"
no. 11 U-veiner, 1/8"
no. 12 V-tool, 3/16"

Knife:
short-blade carving knife



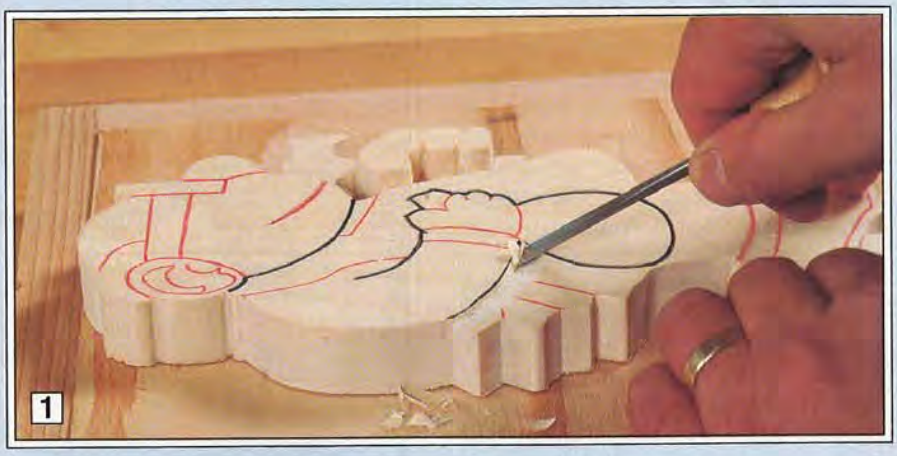
CARPENTER

Start at the lowest level

Begin carving at the deepest relief level. For our carpenter, that would be the palm of the left hand, the one holding the hammer. The left sleeve is just about as deep, so carve it at the same time. Stop-cut the line down the front of the body and the one that takes in the back of the thumb and the fingers.

You can make the stop cuts, which enable you to cut up to a line without tearing out the wood beyond it, with either a V-tool or a knife. To stop-cut with the V-tool, cut along the waste side of the line, holding the wing of the tool nearest the line perpendicular to the surface. If you're using a knife, just slice straight into the wood along the line.

Using your gouges, carve away, or waste, the area until the palm is about half the thickness of the blank. (You'll have to do this in stages; stop-cut, waste to the depth of the stop cut, stop-cut again, waste again, and so on.) Start with the no. 9 gouge to remove wood quickly, then change to a no. 5 gouge to remove the deep grooves.



When you reach a depth of about ¼", draw in and stop-cut the cuff line for the left sleeve (Line A on the pattern). Leave the cuff—the area between the line and the front of the body—a little higher than the palm. While you're working in the vicinity, pare the hammer head and handle down about ¼", leaving them a little more than half the blank thickness.

An arm and a leg

Next, stop-cut the upper arm line (Line B). Continue stop-cutting around the hand and nail bag, back to the elbow. With a shallow gouge, cut toward the line as shown *above* to set out the arm, hand, and bag. Cut about ⅛" deep at the line. Reduce the depth near the shoulder at the top of Line B. The shoulder and upper arm remain at surface height. Stop-cut the jawline and the bottom of the ear, and carve to that line.

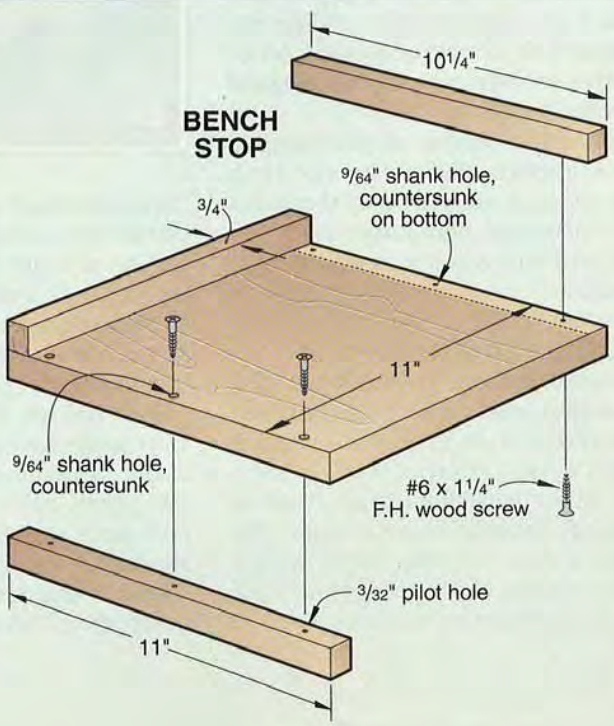
Continued

Get a hold on your work

Before you start carving, you need to come up with a way to hang on to the blank while you work. Here's a simple and effective way:

Cut a piece of scrapwood ¾×9×9" (plywood or particleboard would work). Draw a centerline on the back of the piece (draw it across the grain on solid stock). On the centerline 2" from each edge, drill and countersink a 5/32" hole. Now, center the carving blank on the front of the board, and fasten it from the back with two #8×1¼" flathead wood screws through the holes.

With the blank mounted on this square, you can now hold it securely for carving using a simple bench stop. This setup allows you to turn the carving to different positions for easier working, too. To make a bench stop, refer to the drawing *right*. Assemble the parts with glue and screws.

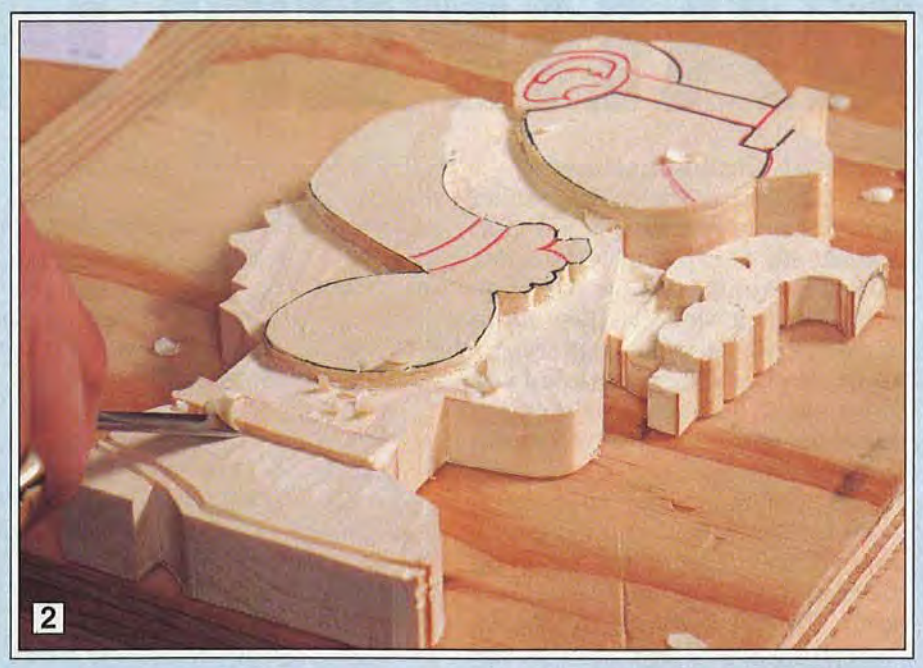


CARTOON CARPENTER

Continue stop-cutting and wasting, taking the body surface down about 3/16". Carve slightly deeper right along the line you're cutting to; this creates a clear separation between levels that enhances the relief effect.

Shave the fingers of the left hand to the thickness of the body. As you carve, you don't need to develop perfectly flat planes. In fact, you want to maintain some curvature so the carving will appear round instead of flat.

Working from the top of the pants cuff (Line C) upward, taper the leg to meet the body. Then, stop-cut Line C, and carve the leg down about 1/16" at the cuff. Stop-cut the lower cuff line (Line D). From about the middle of the shoe, carve to the line, going about 1/16" deep. With a V-tool, carve the shoe sole and heel lines (Lines E and F) about 1/16" deep. Your carving should now look approximately like the one in *Photo 2*.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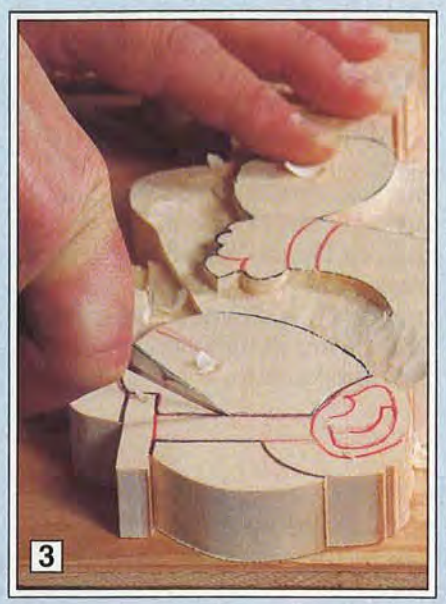
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4

Take it from the top

With the body roughed out, shape the carpenter's head. Stop-cut the nose, glasses, lower-ear outline, and hairline, as shown in *Photo 3*. Carve the nose to about 9/16" thick. Set out the glasses, ear, and hair, carving to about 1/8" deep at the line. Carve the head, rounding the edges. The cheek near the corner of the mouth can stay at original surface height.

Carve the temple of the carpenter's glasses slightly lower than the ear and the frame of the glasses. Carve the hair lower than the ear and the temple, as shown in *Photo 4*.

It's time to shape up

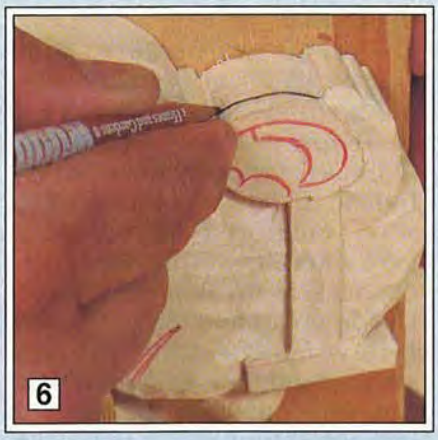
Round the front of the body, the shoulder and right arm, and the leg and foot to give the roughed-out carving shape. Strive for a smooth curvature rather than an abrupt, rounded-over corner. We used a detail-carving knife with a short blade in conjunction with the gouges at this stage.

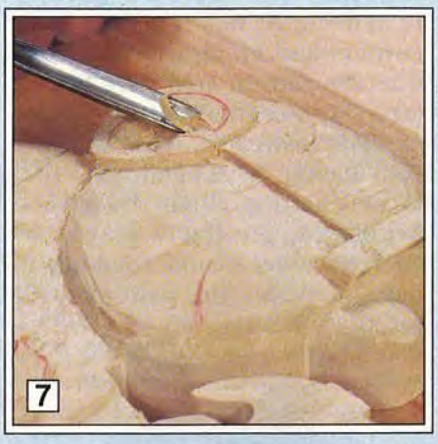
A quick way to start rounding a corner is to shave it away with the inside of a no. 5 gouge, as shown in *Photo 5, opposite page*. Watch the changing grain direction—in some places, you won't be able to use this trick.

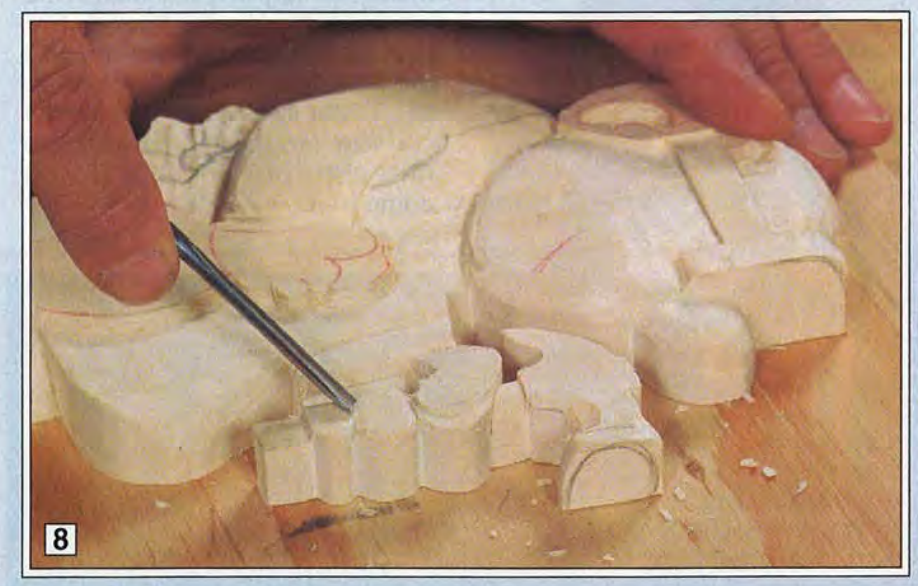
With the no. 9 gouge or a no. 11 U-veiner, gouge out a channel about 1/4" wide along the middle of the pants cuff. Set out the sleeve cuff on the right arm, and carve a similar groove on it.

Round the jawline down to the body, then round the top of the head—including the hair—and the nose. Round the top and bottom corners of the glasses. On the back of the head, draw a line parallel to the surface of the ear and about 1/4" from it, shown in *Photo 6*. Stop-cut that line, the collar line across the back, and the hair line, creating a U-shaped section behind the ear.

Working toward the mounting board, cut away the area to form the back of the head. You can rough in the back of the head now, then complete it after you







remove the carving from the mounting board later. Cut deep enough near the collar that the back of the head visually meets up with the jawline. Taper the back of the ear into the head.

On the face of the ear, stop-cut the outer line (Line G). Then, starting from the space between the lines at the front of the ear, cut along the curve of the inner line with a deep gouge (we used a ¼" no. 9 gouge), as shown in *Photo 7*. Hollow out the lower area, keeping a deep channel along your original gouge cut. Make a shallower hollow in the upper area in the ear. Carve the mouth with a V-tool or knife.

Details make the man

Carve the left hand and the hammer. Draw in the line for the thumb, then set the thumb out from the underlying finger. Taper the thumb back to the cuff, carving it a bit lower than the cuff where they meet, as shown in *Photo 8*. Shape the fingers, hand, and sleeve. Round the top and bottom corners of the hammer face, shape the hammer head, and carve the handle.

Next, model the right hand and the nail bag. Set the hand out slightly from the bag. Form the gathers and wrinkles in the paper bag with V-tool cuts.

Draw in the apron neckline, and carve it. Similarly, carve the corner of the shirt at the lower back corner of the apron. Then, draw in the lines for the apron bow, and carve the knot. A dome with two wings coming from it makes a great bow knot.

Touch up any missing details, or add extra details that will give your carpenter individuality. Finish the surface to your preference. The carpenter looks great as a slightly rough-hewn folk-style carving. Or if you like, you could sand the tool marks away.

Remove the carving from the mounting board. Carve the edges as necessary to remove saw marks, and complete the back of the head. Remove any fuzz or splinters along the back edge.

Dress him up in colors

Paint the completed carving with acrylic paints. Thin the paints to a milky consistency with water, and apply several coats to build the color. Oh, yes. For those nails in his mouth, use ¾"×#19 wire nails.

The flat-backed relief caricature can be hung on a wall, mounted on a plaque, or incorporated into a sign to go on or over your shop door. Or, you could mount it on a base as a stand-up character.

For a stand-up base, cut a ¾×3×7" piece of stock. (We used walnut, and routed a ½" chamfer around the top.) Drill a centered 7/64" hole 2¼" from each end. Countersink the holes on the bottom. Stand the carving on top, and fasten it in place with two #6×1¼" flathead wood screws from the bottom.

Project Design: Larry Green
Photographs: John Hetherington
Illustration: Roxanne LeMoine
Written by Larry Johnston

A VERY CURIOUS DESK

Do you waste time searching for something to write with? Put Sherlock Holmes on the case! Anything stored in this caddy falls under the Great Detective's constant surveillance. Who would pilfer a pencil then? Few projects so fun to build deliver such peace of mind.

There seem to be some patterns to all this

1 Photocopy the full-sized patterns from the *WOOD PATTERNS™* insert in the middle of the magazine. Using rubber cement or spray adhesive, adhere the patterns for the arch sides (A, B) to two 1¼×2½×8¼" pieces of mahogany. (You also could laminate stock for the arch sides.)

2 Adhere the patterns for parts C and D to a piece of ¼"-thick walnut. To make the four parts E, stack four ¼×2¾×4½" walnut blanks together with double-faced tape between them. Apply the pattern to the top of the stack.

3 Stack two ¼×4×8" maple blanks together for the two parts F. Fasten the blanks together at the corners and along the edges outside the pattern area with double-faced tape or small spots of cyanoacrylate adhesive. This will prevent having to separate the parts after cutting, with the risk of breakage. Similarly stack two ¼×4×8" cedar blanks together for parts G. Apply the pattern to the top of each stack.

What you saw will be most important later on

1 Cut out the arch sides (A, B) first. Install a #11 scrollsaw blade (.063×.019" with 9½–12½ teeth per inch) to saw the 1¼-thick stock.

2 Change the blade to a #2 (.028×.012" with 20–23 teeth per inch) to cut out parts C and D. When you cut out Holmes (C), start at the pipe bowl where indicated on the pattern. This way, you'll make the most delicate cuts last, minimizing the chances of breaking the piece. Cut down around the pipe bowl, following the line into the stopped cut that marks the bowl rim. Back out along the line, and make the stopped cut that delineates the bowl side. Back out of that line, then saw on around the bottom of the pattern and up the Great Detective's back. As you saw around the pattern, cut into each interior line as you come to it.

CADDY INDEED

3 Before cutting out part D, drill the hole where shown for the bird's eye. Cut the bottom straight across now; later, you'll mark and cut the notch.

4 Change the blade to a #7 (.045×.018" with 14 teeth per inch). Saw the four-piece stack of parts E, then separate the pieces.

5 Drill ⅛" blade start holes for parts F and G where shown. On each part, complete the inside cuts, then saw around the outside.

Now, we're getting to the bottom of this thing

1 Cut a piece of walnut ¾×5×12" for the base (H). Rout a 5/32" roman ogee along the top edge.

2 Cut two pieces of walnut ¼×⅞×2⅜" for the box fronts (I) and two pieces ¼×⅞×4⅛" for the box backs (J).

3 Attach the pattern for part K to a piece of translucent plastic, and cut it out. (We used pebbled styrene about 3/32" thick made for a ceiling lighting fixture.)

4 Remove the patterns from all parts. Sand the parts as necessary. Ensure that mating edges (see the Exploded View drawing) are square and straight.

Aha! The pieces are all coming together now

1 Assemble the pencil boxes. Glue a front (I) and a back (J) between two sides (E), as shown in the Exploded View drawing. Let the front and back extend slightly beyond the sides at the top and bottom edges, then clamp. Sand the top and bottom flush.

2 Glue one part G to the front of each part F to make the window trim assemblies. Align the edges flush. Glue the Holmes cutout to part G on the assembly that will face the front, as shown.

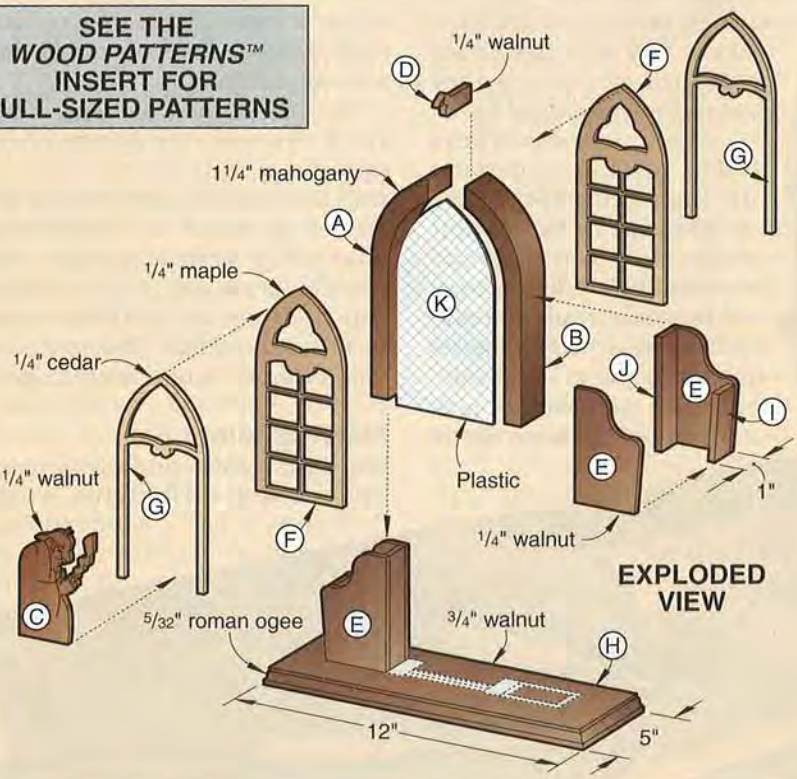
3 Glue a window trim assembly to each side of the plastic glazing (K). Attach the assembly with Holmes in it to the front of the plastic. Cyanoacrylate adhesive (instant glue) will do the trick.

4 Fit the window between the arch sides (A, B). There should be a ¼" gap for the bird between the arch sides at the top, and the bottom must be flush. Adjust as necessary, then glue the arch sides to the window, making the back flush. (Lay the assembly on waxed paper for easier working.) Place the bird in the gap at the top, but don't glue it yet. Clamp the sides.

5 Center the assembled arch and the two pencil boxes on the base, then glue them in place. After the glue dries, slip the bird into the slot between the arch tops. Position its back flush with the back of the arch, then mark the location for the notch in the bottom of the bird to clear the window point. Cut the notch.

6 Using a small carving gouge, a knife, or by sanding, taper the bird's bill to about 1/16" at the tip and round over the corners of the breast and head. Then, glue the crow (or is it a raven?) into place. Apply a clear finish.

SEE THE *WOOD PATTERNS*™ INSERT FOR FULL-SIZED PATTERNS



EXPLODED VIEW

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
A, B* arch sides	1¼"	2½"	8¼"	Mg	2
C* silhouette	¼"	3"	4⅛"	W	1
D* bird	¼"	1⅛"	2⅜"	W	1
E* box sides	¼"	2¾"	4½"	W	4
F* muntins	¼"	4"	8"	Mp	2
G* trim	¼"	4"	8"	C	2
H base	¾"	5"	12"	W	1
I** box front	¼"	⅞"	2⅜"	W	2
J** box back	¼"	⅞"	4⅛"	W	2
K* window	***	4"	8"	P	1

*Blank size; see pattern for finished dimensions.
**Cut long initially, then trim to finished length in accordance with the instructions.
***Translucent material of any thickness up to about ⅛" will work.
Materials Key: C–cedar, Mg–mahogany, Mp–maple, P–translucent plastic, W–walnut

Project Design: Bill Zaun
Photograph: John Hetherington
Illustrations: Roxanne LeMoine, Lorna Johnson

Tried-and-true Joinery of

Centuries ago, skilled woodworkers were called joiners, and no wonder. They crafted an amazing array of tight-fitting, specialized joints for everything from doors to church pews. If you enjoy a challenge, give one or more of these a try.

English historian and writer Joseph Moxon described joinery in a 1645 essay as, "...an art manual whereby several pieces of wood are so fitted and joined together by straight lines, squares, miters, or any bevel, that they shall seem one entire piece." Moxon's words became a definition that distinguished the joiner (and the cabinetmaker) from the carpenter. And such distinction lingered in England and throughout Europe for centuries.

In Colonial America, however, less distinction was made between a carpenter and a joiner. According to tool historians Paul B. Kebabian and Dudley Witney (*American Woodworking Tools,* New York Graphic Society, New York, 1978), tool inventories from early America furnish about the only evidence of the differences between skills—joiners and cabinetmakers not only had more tools than carpenters, they had more specialized tools.

Most woodworkers today, of course, depend on high-tech tools and techniques to craft their projects. The router and its seemingly endless array of bits has replaced the many molding planes owned by joiners and cabinetmakers. Screws, biscuits, and adhesives make unneccessary the variety of joints early woodworkers had to learn, then rely on. Still, old joinery inspires a certain nostalgia, and a respect and admiration for the problem-solving minds and skilled hands that preceded us.

Mortise-and-tenoned joints

Perhaps used more in the past than any other woodworking joint, the mortise-and-tenon has today been mostly replaced by dowel joints and simple screw joints. Yet even today's woodworker will take the time to shape mortise-and-tenons for a project of heirloom quality.

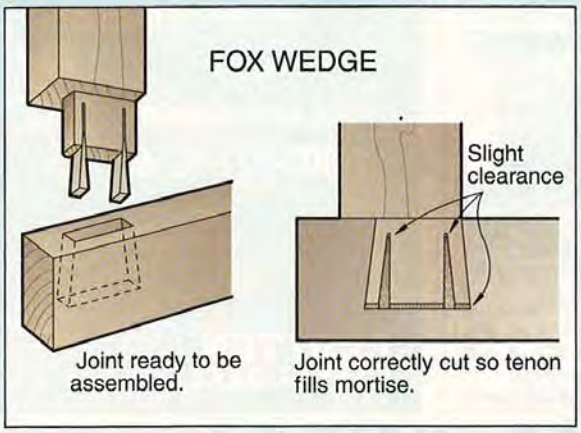
Mortise-and-tenoned joints appeared in every facet of woodworking at one time or another. That's why the varieties run into the hundreds. Among them, the *fox wedge* (shown *opposite, top left*) supplies great strength when a through-tenon wouldn't look right, such as on a chair leg-and-rail assembly.

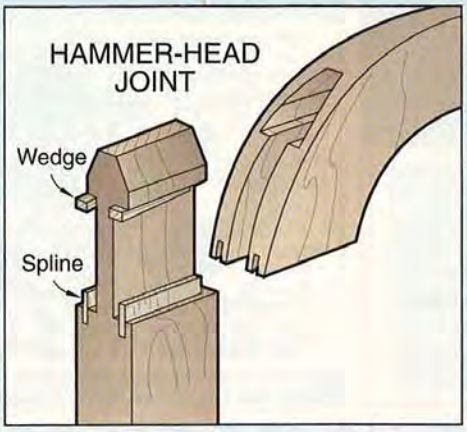
One of the most unusual joints you'll ever see, the *hammer-head* (shown *opposite, top center*) was used in the past to join the arched members of a round-top door to the straight uprights. The wedges draw the joint together, and the tongues hold the wood in at the shoulders. This joint was cut before the curve was shaped.

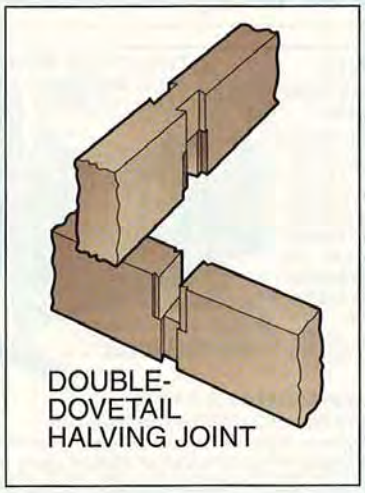
Halving joints

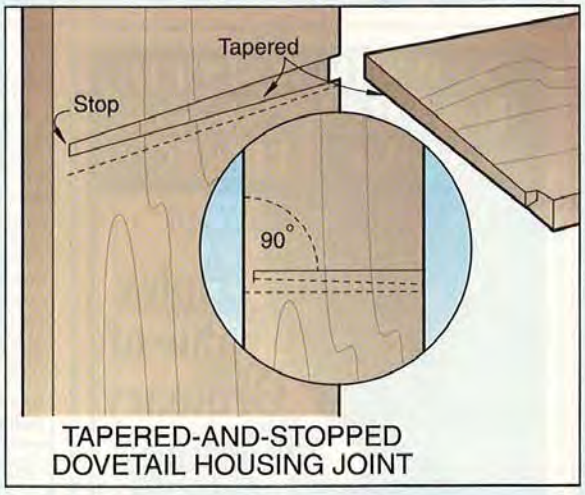
For light frames and cross members, L-shaped halving joints

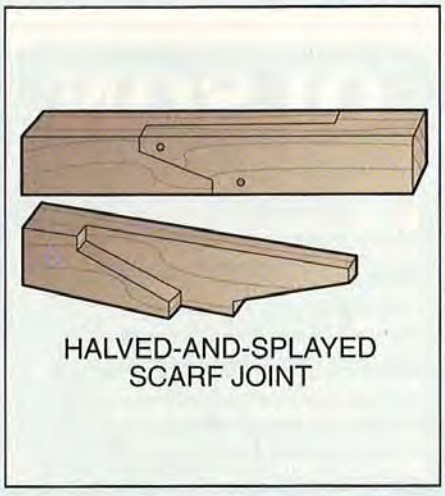
yesteryear











prove simple to make. Just remove half the wood from each piece—the front face of one, the rear face of the other—and fasten them together.

To strongly join two pieces of wood together at an angle, say in a latticework or railing, joiners applied the *strong-oblique halving joint* (shown *above, top right*). For more strength and attractiveness, joiners looked to the *double-dovetail halving joint* (shown *above left).* There's no doubt that it's a lot of work, but with two dovetails cut in each piece, this strong joint resists stress in two directions. Patternmakers found it useful in designs subject to heavy strains.

Housed joints

Principally used in the construction of stationary cabinet and book shelves, the housed joint was made as either a simple cross-grain dado into which the shelf fitted, or as a dovetail. A dovetail version made for a tighter fit, but at the same time sliding in the shelf proved difficult. The deeper the shelf, the more difficult was the chore.

One rather simple solution to the problem was the *tapered-and-stopped dovetail housing.* Shown *above*, it was perfect for tall bookcase units in which the sides were inclined to bow outward. The dovetail "locks" the shelf in and prevents this. And because the taper is cut on the bottom of the shelf, the assembly is always bound to be square.

Scarfed joints

Joining two short boards or timbers to get a longer one usually required a scarfed joint. This was true whether the project was a boat or a barn.

A simple scarf joint required long flat tapers on each end of each piece of wood to be joined. The rule was 6" of taper for every 1" of thickness. The strength was in the gluing surface. The *halved-and-splayed scarf, above*, was an improved version that withstood sideways stress. In timbers, it was pinned; in small projects, glued.

Photograph: John Hetherington Illustrations: Lorna Johnson

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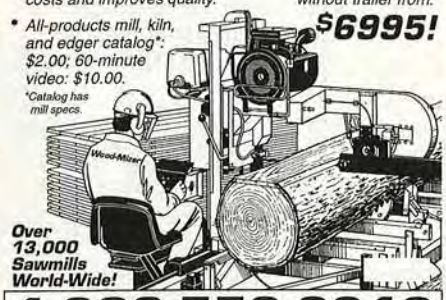

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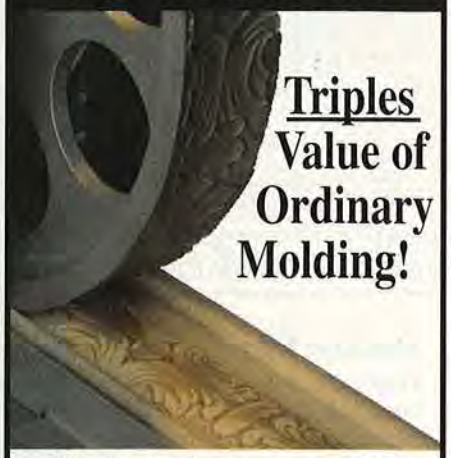

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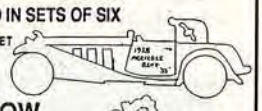

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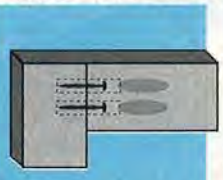

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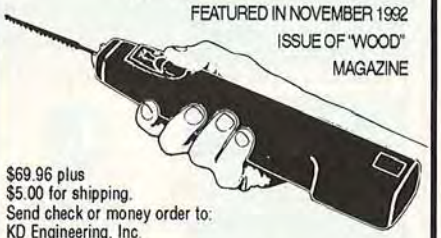

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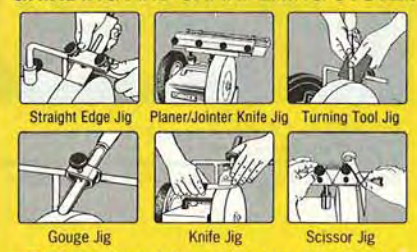

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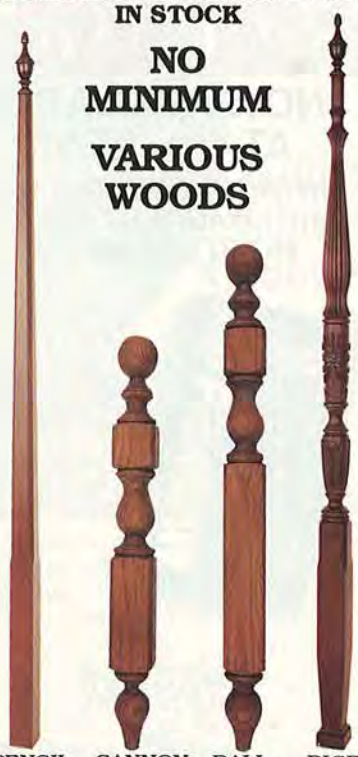

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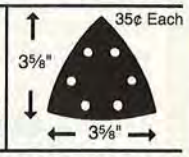

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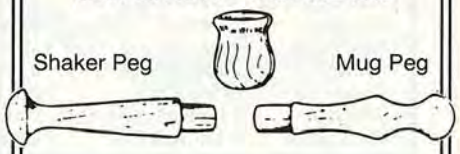

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SOME SURPRISING SAWDUST SOLUTIONS

Swamped by sawdust? Surrounded by shavings? Try these practical ways to rid your shop of waste, without adding to your local landfill.

Wax some sawdust for starters

With Christmas right around the corner, now's the time to sack up some sawdust to give away. You'll have to gift-wrap it first, though. As holiday fire starters, your unwanted sawdust will burn as brightly as a long-lasting friendship. Like kindling, these colorful little bits of magic get a fireplace (or campfire) going quickly.

Here's the material you'll need for three or four dozen:

- red, white, and green tissue paper wrap
- a pound of paraffin
- gift ribbon
- a grocery sack full of sawdust

Slowly heat and melt the paraffin in the top part of a double-boiler on the stove. Turn the heat down just enough to keep the paraffin liquid, and place a cookie sheet nearby. Then, cut the tissue paper into 10" squares.

For each fire starter, ladle about one-half cup of sawdust into the center of a tissue square. Wrap the tissue tightly around the sawdust and twist the loose ends together. Tie a piece of gift ribbon around the twist.

Dip each wrapped sawdust ball into the paraffin until saturated (about half a minute). Then, set it on the cookie sheet to harden. A dozen of these in mixed colors makes a welcome gift.

Send it away to a manger

Livestock owners welcome wood shavings and sawdust as bedding material for their animals. And it doesn't make any difference whether your wood waste is softwood or hardwood. Both work the same. Don't, though, pass along any walnut, especially to horse lovers.

"Walnut sawdust, chips, or shavings will kill horses," says Brian Andrew, owner of Andrew's Pallet and Wood Fiber Co. in Des Moines, Iowa. At Andrew's, walnut is always excluded from bedding that they sell in quantity to farmers and others who raise livestock. "There's a chemical in walnut that's released when horses urinate on it. Then, it's absorbed through their hooves and into their system." Brian adds that he hasn't heard of walnut having the same effect upon other animals. But, it's much better to be safe than sorry.

Help your garden grow

If you or your friends maintain a garden, you have a nearby depository for your wood waste. But you shouldn't use sawdust or wood shavings indiscriminately.

Andy Baker, a wood-waste researcher at the USDA Forest Service's Forest Products Laboratory in Madison, Wisconsin, explains some cautions. "Bacteria requires nitrogen to break wood down. And in the garden, the only place it can get it is from the soil. So, you'll have to add a nitrogen-rich fertilizer to replace the loss," he notes. "For already acid soils, adding wood may be too much."

And, there's a difference between shavings and sawdust, adds Andy. "In my garden, I till sawdust in to make a finer loam. It breaks down quicker, too. Shavings, on the other hand, can take more than a year to deteriorate. They're best used for mulch." He also notes that wood waste need not be aged. You can use it fresh from the shop, although Andy does apply his sawdust in the late fall, then digs it in deep with a tiller come spring planting time.

Support local arts and crafts

Some of the most beautiful colors that potters can achieve on glazed clay result from sawdust. That's right, sawdust.

Potters who produce pit-fired vessels or those who use an ancient Japanese smoke-coloring technique called *raku* rely heavily on sawdust and/or wood shavings as combustion material. So, if there are any potters in your area, they're likely to haul away all the fine waste that you can produce.

Save some for the shop

Some savvy woodworkers, especially woodturners, maintain a collection of sawdust from different species stored in jars. This multihued sawdust inventory comes in handy as filler to hide holes, cracks, imperfections, and mistakes. Just mix the sawdust with epoxy for a perfect color match to the wood.

Photograph: King Au

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WOODWORKER'S RESOURCE

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WOODWORKER'S RESOURCE

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3727DVS	6" DUSTLESS VS RANDOM ORBIT SANDER	154
3727DVSW	6" DSTLS VS RANDOM ORBIT SANDER W/CS	164
B1650K	BISCUIT JOINER KIT	154
B1650KW	BISC JOINR KIT W/250 BISC & GLUE BOTTLE	163
B4050	NEW IN LINE GRIP JIGSAW	113
B4050K	B4050 W/3 EXTRA LONG BLADES	119
B7000	TRIANGULAR CORNER SANDER	68
B7000A	B7000 W/EXTENDER PAD & 12 SHTS PAPER	79
B7001	VAR SP CORNER SANDER	91
B7001A	B7001 W/EXTENDER PAD & 12 SHTS PAPER	102

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3500	12V CORDLESS HAMMER DRILL KIT	197
3054VSRK	12V CORDLESS KIT W/2 BAT, CASE	185
B2300K-06	12V CRDLS DRILL KIT W/2 BATT & LIGHT	174

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1605-02K	1605-02 W/250 BISCUITS & GLUE BOTTLE	143
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2736-04K	2736-04 W/12 VOLT LANTERN	155
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3400K	3400 TABLE SAW W/CARBIDE BLADE & STAND	209

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TR12	3 HP PLUNGE ROUTER	192

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333	QUIKSAND W/HOOK & LOOP, DUSTLS	74
333K	333 W/CASE & 50 SHEETS PAPER	102
334	QUIKSAND W/STIKIT, DUSTLESS	74
334K	334 W/CASE & 100 SHEETS PAPER	102
340	1/4 SHT FIN SANDER W/DUST P/U	49
345	SAW BOSS 6" CIRCULAR SAW	104
347K	7 1/4" FRAMERS SAW, 15 AMP WITH CASE	127
351	3" X 21" BELT SANDER	156
352	3" X 21" BELT SANDER W/DUST BAG	162
352VS	3" X 21" BELT SANDER DUSTLESS W/VAR SP	165
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361	3" X 24" BELT SANDER	189
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363	4" X 24" BELT SANDER	199
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690K	690 W/CS, EDGE GUIDE, & TEMP GD KIT	189
691	1 1/2 HP "D" HANDLE ROUTER	152
691K	691 W/CASE, EDGE GD & TEMP GD KIT	209
693	PLUNGE BASE ROUTER, 1 1/2 HP	168
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696	SHAPER TABLE	127
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7519	3 1/4 HP FIXED BASE ROUTER-1 SP	237
7536	2 1/2 HP FIXED BASE ROUTER	204
7537	2 1/2 HP FIXED BASE "D" HNDL RTR	213
7538	3 1/4 HP PLUNGE ROUTER-1 SPEED	242
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7549	TOP HANDLE BAYONET SAW	127
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9444	PROFILE SANDER KIT WITH ACCESSORIES	113
9447	7 1/4" CIRC SAW W/BRAKE & CASE	158
9647	TIGER CUB RECIP SAW KIT	118
9737	RECIPRG TIGER SAW, 9.6A, QUICK CHNG CHUCK	159
9843	7 1/4" LEFT SIDE SAW W/BRAKE & CASE	158
9853S	12V CRDLS KIT W/2 BAT, CASE	163
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97335	5" RANDOM ORBIT SANDER W/CASE	129
97336	6" RANDOM ORBIT SANDER W/CASE	134
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LS1011	10" COMPOUND MITER	509
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DW421	5" DSTLS RNDM ORB SANDER, VELCRO	77
DW430	3" X 21" DUSTLESS BELT SANDER	167
DW431	3" X 21" DSTLS BELT SANDER VAR SP	183
DW443	6" ROS SANDER VAR SP, VELCRO	139
DW444	SAME AS ABOVE WITH PSA PAD	139
DW610	1 1/2 HP ROUTER, 9 AMP	148
DW615	1 1/4 HP PLUNGE ROUTER, VAR SP	164
DW625	3 HP HVY DTY PLUNGE RTR, VAR SP	275
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DW682K	BISCUIT JOINER KIT	219
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ML618	18" WOOD MINI LATHE	209
OSS450	OSCILLATING SPINDLE SANDER	156
SC162VS	16" VS SCROLL SAW	164

Milwaukee

0407-1	12V KYLS CDLS DRILL KIT W/2 BAT, CS	174
6490	10" MITER SAW	264
6494	10" CMPND MITER SAW W/CARB BLADE	322
6507	VAR SPD SAWZALL W/BLADES & CS	144

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Which is the best direction to move the router when cutting?

I have seen conflicting information about the direction to move my router while using it. The router's manual says to move the tool clockwise around the wood, or with the rotation of the cutter.

Two router books I have advise me to move the tool in the opposite direction, or into the rotation of the router bit. The authors say this gives better control of the router.

However, when I tried this second method, the router raised a long splinter on the edge of the tabletop I was shaping. Who's right?

—Joseph M. Just, M.D., Ely, Minn.

We prefer to move the router counter-clockwise around a board. This way, we're feeding the wood into the rotation of the router bit, and have more control of the tool. This is of particular importance when you are moving the router along a straightedge or a template. A router moved clockwise or with the bit rotation may jump away from the guide when the bit strikes a knot or other dense area of wood.

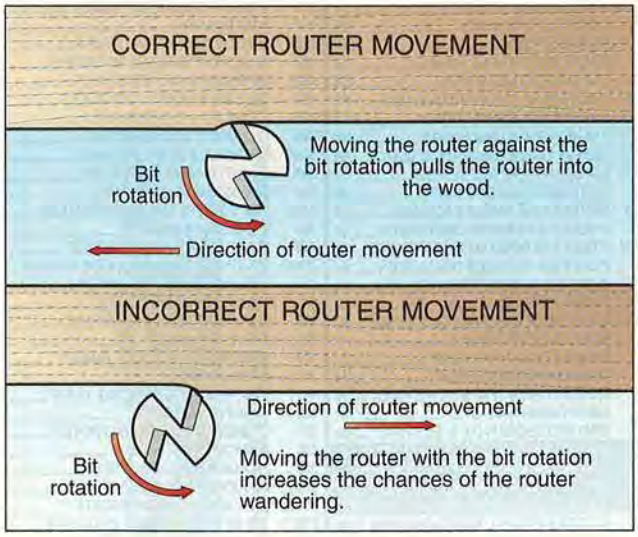
Here are some ways to reduce the chances of chipping or raising splinters while cutting against the router-bit rotation:

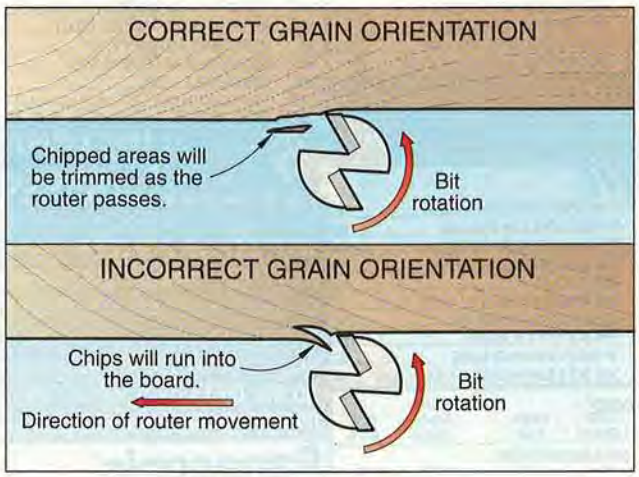
1 Make multiple shallow cuts with the router rather than trying to do the job in one pass. Finish the routing with a light clean-up cut.

2 Use sharp, carbide-tipped router bits. A dull bit will have a much greater tendency to grab and tear out splinters from the edge you are routing.

3 Plan the assembly of a panel or frame to minimize the amount of against-the-grain cutting. By routing with the grain, any splinters will cleanly separate from the workpiece without extending into the wood as shown *right*.

4 Move the router more slowly when cutting against or across the grain. This allows each pass of the router-bit cutting edge to remove less wood, resulting in a cleaner cut with a lower chance of tearing out splinters from the edge.


CORRECT ROUTER MOVEMENT
Bit rotation
Moving the router against the bit rotation pulls the router into the wood.
Direction of router movement
INCORRECT ROUTER MOVEMENT
Direction of router movement
Bit rotation
Moving the router with the bit rotation increases the chances of the router wandering.


CORRECT GRAIN ORIENTATION
Chipped areas will be trimmed as the router passes.
Bit rotation
INCORRECT GRAIN ORIENTATION
Chips will run into the board.
Direction of router movement
Bit rotation

But I wanted a square frame!

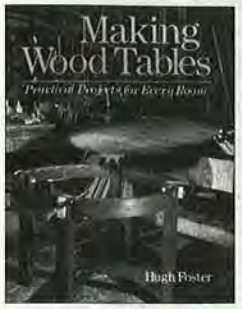
I was trying to make a picture frame from zebrawood, but every piece I tried to rip turned into a burned, bent and twisted board. The kerf kept closing as soon as it passed the blade, and the strip of wood developed a curve as it came off the saw. I am using a new blade, and the fence is parallel to the blade. Help!

—Ron Spoto, LaVerne, Calif.

We suspect that you got some zebrawood with grown-in or dried-in stresses. As soon as you changed the balance of these stresses by cutting the board, the pieces began to curve. Although this can happen in almost any wood, it's more likely to occur in the harder and denser species such as zebrawood.

To solve this problem, first rip the board into pieces wider than needed. If practical, cut the pieces to within 1" of finished length, and about ¼"-½" wider than the final width. Stack and sticker these pieces for a few days to allow them to adjust to the stress changes. Then, cut them to final size.

Continued on page 98



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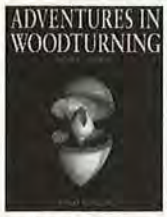

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ASK WOOD

Continued from page 94

How do I choose a tablesaw?

I want to become more involved in woodworking, but I question spending hundreds of dollars on a tablesaw. What "rule of thumb" or criteria should I use in making a decision on which saw to buy?

— Doug Forsberg, Gagetown, Mich.

For most of us, cost often becomes an important consideration when buying a tool. However, experience has shown the staff at WOOD® magazine that we usually get what we pay for when we purchase tools. The more-expensive heavy-duty machines generally are more accurate and will last longer than the lighter-duty saws. With that short sermon out of the way, here are some other factors to consider when purchasing a tablesaw:

1. The amount of space you have for the tablesaw. Woodworkers with smaller shops and limited space may find themselves happier with a benchtop tablesaw. You will sacrifice some accuracy with this type of saw, and cutting sheet goods and long boards will be more difficult than with a larger saw. However, these saws take up less space, can be moved from place to place with more ease, and generally cost less than floor-model tablesaws.

2. Match your saw to your work needs. If you build just a few projects a year, primarily out of ¾" or thinner wood, a light- (benchtop) or medium-duty (1½ hp) saw will suffice. If you do daily work with hard and thick woods, we recommend that you purchase a heavy-duty (3 hp) tablesaw.

3. Materials used to make the saw affect the cost. We prefer cast iron for the tabletop and the blade-carriage assemblies. We choose anodized cast aluminum as second for saw tabletops, and cast aluminum second for blade carriages, followed by stamped steel. But well-made cast-iron parts cost more than cast-aluminum parts, which, in turn, cost more than stamped-steel pieces.

4. Rip fences and guides indicate tablesaw quality. The better tablesaws have the rip fence mounted on a tubular steel guide. Here are some other fence guide choices, in order of decreasing cost (and accuracy): angle-iron; flatiron; and guides cast or formed into the tabletop.

5. Tablesaw price reflects the type of motor. Costlier tablesaws generally use an induction-type motor that's designed to operate for long periods of time under a heavy load. Most benchtop tablesaws have a lighter-duty, universal motor, like those found in portable power tools. For more information, look at the article "$300 to $700 Tablesaws" in our February 1994 issue.

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23-710	New Sharpening Center	210	165
23-680	6" Bench Grinder 1/4 HP	86	69
11-950	8" Drill Press	199	128
31-050	1" Belt sander 2.0 amp	104	75
31-460	4" Belt/Disc Sander	198	129
40-560	16" 2 speed Scroll Saw	266	169
40-530	NEW 16" Scroll Saw	153	115
11-990	12" Bench Drill Press	276	184
11-090	32" Radial Bench Drill Press	399	305
43-505	1/2" Bench Router/Shaper	399	295
22-540	12" Bench Top Planer	Sale	385
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36-220	10" Compound Mitre Saw	350	215
28-180	Bench Band Saw	232	158
28-190	NEW 12" Band Saw	465	395
40-640	20" Bench Scroll Saw	466	295
37-070	NEW 6" w/spd Bench Jointer	337	258
14-650	Hollow Chisel Mortiser	668	285
46-700	12" Wood Lathe	548	449
33-990	10" Radial Arm Saw	818	695
37-280	6" Motorized Jointer	488	389
33-055	8-1/4" Sawbuck comp w/legs	865	629
36-040	8-1/4" Compound Mitre Saw	224	149
36-905	30" Unifence	385	249
36-906	50" Delta Unifence	525	305
36-755	10" Tilting Arbor Saw	1264	1039
17-900	16-1/2" Floor Drill Press	462	415
33-060	"Sidekick" Miter Saw	510	389
37-190	6" Deluxe Jointer	554	479
36-275	8-1/4" Builders Saw	444	265
36-210	10" Compound Mitre Saw	438	255
36-070	10" Mitre Saw	284	165
34-555	Sliding Table	459	289
22-661	13" Planer w/ stand 2 HP	1513	1239
22-675	NEW DC380 15" Planer	1439	1275
37-154	6" Jointer w/ mobile base	1451	1239
34-444	Contractors Table Saw	812	659
34-445	34-444 Saw w/30" Unifence	1200	829
	above saw comes w/ mobile base		
28-283	14" Band Saw w/enc. stand	910	779
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36-250	NEW 10" Slide Compound Saw	825	489
36-230	NEW 12" Compound Mitre Saw	480	359

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6528	above Sawzall w/wired cord	316	178
0408-6	12V Drill w/kyls chuck & 2 batt		172
0406-1	9.6V Drill Kit with 2 batteries	332	159
0224-1	3/8" Drill 4.5 amp magnum	227	128
0234-1	1/2" Drill 4.5A mag 0-850 rpm	237	139
0235-1	1/2" Drill w/keyless chuck	237	139
0244-1	1/2" Drill 4.5A mag 0-600 rpm	237	139
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	198	119
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	195	115
0375-1	3/8" close quarter Drill	237	139
0379-1	1/2" close quarter Drill	268	158
6546-1	cdls Scrwdvr 200 & 400 rpm	141	84
6547-1	6546-1 w/bits, 1/4" chuck, & case	176	105
5399	1/2" D-hdle Hammer Drill Kit	332	194
6507	Original SawZall with case	264	152
5397-1	3.6" var. spd Hammer Drill Kit	255	145
5371-1	1/2" var. spd Hammer Drill Kit	340	188
3107-1	1/2" v/spd right angle Drill Kit	399	228
6754-1	Drywall Gun 0-4000 5.4 amp	196	114
3300-1	1/2" var. spd right angle Drill	356	214
5680	Router 2 HP w/ 1/4" & 1/2" collets	362	165
6142	4-1/2" Grinder w/case & access	208	125
6749-1	Drywall Gun 0-2500 5.4 amp	218	132
6365	7-1/4" Circular Saw 13 amp	216	125
6366	6365 w/fence & carbide blade	228	129
6368	6365 w/fence,carb. blde,& case	249	142
6377	7-1/4" Worm Drive Saw	330	189
6256	Top Handle Jig Saw	264	158
6490	10" Mitre Saw	444	259
6491	6490 w/ carbide blade & bag	532	325
6494	10" Compound Mitre Saw	444	319
0422-1	NEW 12V Hammer Drill w/2 batt	430	249
0431-1	NEW 12V Drill w/ 2 batteries	385	229

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LU82M010	Cut-off 10"	60	93	45
LU84M011	Comb 10"	50	78	42
LU85M010	Super Cut-off 10"	80	115	59
LM72M010	Ripping 10"	24	69	38
LU73M010	Cut off 10"	60	84	45
LU87M010	Thin Kerf 10"	24	72	42
LU88M010	Thin Kerf 10"	60	88	45
LU98M010	Ultimate 10"	80	128	68
LU91M010	Compnd Mitre 10"	60	88	54
F410	NEW Quiet Blade 10"	40	95	49
F810	NEW Quiet Blade 10"	80	135	74
TK303	7-1/4" Finishing	40	38	25
TK906	10" Combo	50	53	32
SD308	8" Dado - Carbide		230	119
SD506	6" carbide w/case & shims		292	155
SD508	8" carbide w/case & shims		344	168
F10	2-1/8" x 3/4" Biscuit 1000 Qty		43	29
F20	2-3/4" x 1" Biscuit 1000 Qty		45	29
FA	Assorted Biscuits 1000 Qty		45	29
FB100	16 piece Forstner Bit Set		338	189
94-100	5 pc. Router Bit Door System		320	159
TR215	10" Slide Cmpd Mitre Saw		688	369

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FT2000E	3-1/4 HP v/sp Plunge Router	410	209

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JS100	Biscuit Jointer w/ case	334	168
JS102	Biscuit Jointer w/fence & case	355	179

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Model	Description	List	Sale
6172DWE	3/8" v/spd Drill Kit w/ 2 batt	220	109
5090DW	3-3/8" Saw Kit 9.6 voll	270	148
ML900	Incandescent Flashlight 9.6V	Sale	37
DA391DW	3/8" angle Drill Kit 9.6 volt	312	179
6012HDWE	2 speed Drill Kit w/2 batt.	243	135
6095DWE	6095DW Drill Kit w/2 batteries	270	139
6095D	6095DW Drill only & case	Special	79
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28

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6312DWG	12V 1/2" Drill Kit w/ LED batt	432	239
6201DWHE	9.6V 3/8" Drill Kit w/ 2 batt.	351	175
6211DWHE	12V 3/8" Drill Kit w/ 2 batt.	368	185
6311DWHE	12V 1/2" Drill Kit w/ 2 batt.	399	205
5007NBA	7-1/4" Saw w/electric brake	263	138
9900B	3" x 21" Belt Sander w/bag	344	179
9924DB	3" x 24" Belt Sander w/bag	329	189
4301BV	Orb. var. spd Jig Saw 3.5A	292	155
JR3000V	var. speed Recip Saw w/case	252	139
9820-2	Blade Sharpener	394	215
N1900B	3-1/4" Planer with case	244	134
N9514B	4" Disc Grinder 4.6 amp	111	65
B04552	1/4 sheet Pad Sander w/bag	98	55
DA3000R	3/8" Angle Drill	314	185
2708W	8-1/4" Table Saw	585	309
2711	10" Table Saw with brake	1067	599
6405	3/8" Drill Rev. 0-2100 rpm	112	68
6510LVR	3/8" Drill Rev. 0-1050 rpm	168	98
6013BR	1/2" Drill Rev. 6 amp	280	149
9401	4" x 24" Belt Sander w/bag	378	239
4303C	var. speed Orbital Jig Saw	351	205
5077B	7-1/4" Hypoid Saw	281	155
5007NB	7-1/4" Circular Saw 13 amp	232	124
5007NBK	5007NB Saw w/ plastic case	Sale	129
LS1011	10" Slide Compound Saw	946	525
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SN325	Nailer 1-7/8" - 3-1/4"	665	419
SLP20	New Pinner w/cse 5/8 -1-5/8"	399	278
SKS	Stapler 5/8" - 1-1/2"	390	275
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SN80	Fram. Nailer-Full Hd 2"-3-1/2"	638	449
SN65	15% more power than SN60	709	479
SFN40	NEW Finish Nailer 1-1/4 - 2-1/2	571	389

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RN45	Coil Roof Nailer 3/4 - 1-3/4	845	395
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BT35-2	Brad Tacker 5/8" - 1-3/8"	275	159
BT35-2K	BT35-2 w/ case, oil, & brads	299	169
CWC100	1 HP Pancake Compressor	463	289
MIIIFS	Flooring Stapler 15 gauge	931	529
S32SX-1	Finish Stapler - 1/2" - 1-3/8"	275	159
S32SX-1K	S32SX-2 with case & oil	269	169

SKIL SIZZLERS

2735-04	12 volt cordless Drill Kit	249	144
2736-04	2735-04 with keyless chuck	269	148
1605-02	Biscuit Joiner w/case	221	135
3400	10" Table Saw - Bench Top	270	189
77	Famous 7-1/4" Worm Drive Saw	Sale	144
77M	NEW 77 Mag Worm Saw - 2 lbs lighter than Model 77	Sale	159

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EY6207BC	NEW 12 volt 1/2" Drill w/keyless chuck var. speed w/15 min. charger & case	420	222
EY6282EQK	Var. spd 9.6 volt Drill with 15 min. charger, case & NEW **Ironman** battery	315	169
EY62821DKW	9.6 volt Drill Kit w/2 batt.	395	165

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EY6100CQKW	Same as EY6100CRKW but has 15 minute charger	420	198
EY6100EQK	NEW 12 volt Drill kit with NEW **Ironman** battery, 15 min. charger, & case	375	199
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DW945K-2	12V cdls Drill Kit w/2 batt	309	185
DW610	1-1/2 HP 2 handle Router	274	149
DW411	1/4 sheet Palm Sander	97	58
DW100	3/8" Drill, 4 amp,0-2500 rpm	118	68
DW682K	Biscuit Joiner with case	429	219
DW705	12" Compound Mitre Saw	706	359
DW625	3 HP var. spd PlungeRouter	Sale	275
	DW625 Router comes with FREE DW6966 Fine Depth Adjuster!		
DW675K	3-1/8" Planer with case	289	164
DW431	3 x 21 v/spd Belt Sander	331	184
DW421	5" Palm Randrom Orbit Sander	125	74
DW444	6" Ran Orb Sander-PSA pad	266	139
DW443	DW444 w/hook & loop pad	266	139
DW673K	NEW Laminate Trimmer Kit	364	215
DW930K	NEW 12V 5-3/8" Trim Saw Kit	370	199
DW935K	NEW 14.4V 5-3/8" Trim Saw Kit	444	237
	DW935K comes with two batteries!		

DEWALT CORDLESS DRILLS

DW952K	3/8" v/spd w/two 9.6V batt	280	145
DW962K-2	3/8"v/sp w/two 9.6V XR batt	324	179
DW972K-2	3/8"v/sp w/two 12V XR batt	352	189
DW904	12 volt flashlight	29.95	
DW972K-2	drill & DW904 flashlight	Sale	205
DW991K	3/8"v/sp w/one 14.4V XR batt	370	199
DW991K-2	above drill w/ 2 batteries	Sale	225
DW944KQ	1/2" v/spd w/1 14.4V XR batt	450	235
	Above drill kits come w/ charger & steel case!		
DW991KS-2	DW991K drill, DW935 trim saw, & case	Sale	339

HITACHI TOOLS

C8FB	8-1/2" Slide Compound Saw	1400	575
C10FS	10" Slide Compound Saw	1595	745
P12R	12-9/32" Planer	1470	795
P12RA	Planer/Joiner	1940	995
G12SA	4-1/2" Grinder 6.9 amp	160	89
NR83A	Fram Nailer 2 - 3-1/2 Full Head	700	409
NR83AA	Framing Nailer 2 - 3-1/2	750	425
NT65A	16 ga. Brad Nailer 1 - 2-1/2	610	345
NV45AB	Coil Roofing Nailer 7/8 - 1-3/4	750	435
DN10DYK	9.6V right angle Drill Kit	350	189

BIESEMEYER FENCES

B-50	50" Commer. Saw Fence	345	298
T-SQUARE 52	52" Homeshop Fence	279	238
T-SQUARE 40	40" Homeshop Fence	259	208
T-SQUARE 28	28" Homeshop Fence	249	198

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Open Cap	List	Sale	Box of 6
#0	8"	4-1/2"	19.76	11.75	58.00
#1	10"	6"	22.63	12.50	69.00
#2	12"	8-1/2"	25.95	14.50	78.00

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	3/4" Black Pipe Clamps	14.87	7.80	88.95
52	1/2" Black Pipe Clamps	12.40	6.70	71.50

BOSCH

Model	Description	List	Sale
1587VS	NEW Top Hand "CLIC" Jig Saw	292	149
1584VS	NEW Barrel "CLIC" Jig Saw	285	149
Bosch Metal Case for above Jig Saws		34	32
Bosch 30 blade assortment for Jig Saws		28.99	
	1584VS or 1587VS with steel case and 30 Bosch blades	Sale	189
1272D	3" x 24" Belt Sander with bag	375	209
1273D	4" x 24" Belt Sander with bag	380	218
1347AK	4-1/2" Grinder w/cs & access.	185	105
1194VSR	1/2" var. speed Hammer Drill	282	155
1194VSRK	above Hammer Drill w/case	313	169
1609K	Lam Installers Kit with 1609	343	189
1609KX	Deluxe Installers kit	405	234
1604A	1-3/4 HP 2 Handle Router	250	142
1604AK	same as above w/cse & acc	318	185
1606A	1-3/4 HP D-handle Router	295	179
3270DVS	3 x 21v/spd belt sander w/ bag	270	165
1273DVS	var. spd 4" x 24" Belt Sander	415	228
1613EVS	2HP v/sp Plunge Router	359	199
1615EVS	3 HP v/spd Plge Router	505	289
1632VSRK	Recip Saw 8.4A orb-v/spd	225	159
3050VSRK	9.6V cdls v/sp Drill Kit comp	288	149
3051VSRK	3050VSRK w/keyless chuck	299	149
3054VSRK	12V Drill Kit w/ 2 batteries	330	185
3300K	NEW 12V Drill Kit w/ 2 batt	348	189
3310K	NEW 12V T-handle Drill Kit	348	189
3110K	NEW 9.6V T-handle Drill Kit	320	185
3283DVS	5" Random Orbit Sander	169	98
3283DVSK	3283DVS Kit complete	199	118
3725DVS	NEW 5" Random Orbit Sander	258	149
3727DVS	NEW 6" Random Orbit Sander	268	154
B1650K	Biscuit Joiner	289	159
B7000	Corner Detail Sander	122	68
B7001	B7000 w/ variable speed	Sale	89.95
B4050	In Line Jig Saw	199	115
11230EVS	SDS-max 1-1/2" Rtry Hmr	685	525
11231EVS	SDS-max 1-3/4" Rotary Hmr	1336	809
11223EVSN	NEW SDS-max 2" Rotary Hmr	1548	929
11224VSR	7/8" SDS Rotary Drill	495	229

AEG POWER TOOLS

Model	Description	List	Sale
TXE150	6" var/spd Ran Orb Sander	304	142
HBSE75S	3"x21" var/spd Belt Sander	309	182
BSPE100X	Top Handle Jig Saw w/case	286	164
FSPE100X	Barrel Grip Jig Saw w/case	274	164

PORTA NAILER

401	Porta Nailer complete	265	205
501	Face Nailer complete	265	205

BLACK & DECKER

2694	7-1/4" Super Sawcat w/case	285	158
2695	8-1/4" Super Sawcat w/case	328	179

DAVID WHITE

LP6-20	Sight Level package - 20x	310	205
LP6-20XL	LP6-20 w/9056 tripod & 7620 rod		265
LT8-300	Level Transit - 26x	695	449
LT8-300P	above Level w/optical plum	821	529
LT6-900	Level Transit - 20x	389	254
ALT6-900	Automatic Level - Transit -18x	638	399
ALTP6-900	above Level w/tripod & rod	708	479
ALP6-18HD	above Level w/tripod & rod	570	385
ML100 I	NEW Laser Level	1099	945
ML100	NEW Laser Level w/detector	1249	1075
LL100	NEW Finish Line Laser Level	210	135

RYOBI SPECIALS

RE600	3 HP Plunge Router	500	226
BE321	3" x 21" var. spd Belt Sander	310	148
BT3000	10" Table Saw with stand	1125	529
AP12	12" Bench Planer	884	395
BS900	9" Bench Band Saw	340	165
OSS450	Oscillating Spindle Sander	340	159
DC500	Detail Carver	120	64
TSS200	8-1/2" Slide Comp. Saw	895	399
CD125K	NEW 12V cdlss Drill w/ 2 batt	175	109

SIOUX TOOLS

8030	3/8" var/spd Drill	250	145
8000	3/8" var/spd close qtr Drill	201	125
690	5" Air Random Orbit Sander	139	132

Msx636 FEIN	Triangle Sander Kit	Sale	199
Msx625 FEIN	New Air Triangle Sander	Sale	189
Lamello	New Cordless Biscuit Joiner	695	549
LPN672 PONY	Air Palm Nailer w/glove	Sale	94.99
RTM01 ROTOZIP	Drywall cut out unit		68.95

QUAL-CRAFT PRODUCTS

2200	Pump Jack	79	58
2201	Pump Jack Brace	30	20
2203	Pump Jack guard rail holder	31	21
2204	Workbench & rail holder combo	53	39
	Buy any 6 (can be assort.) deduct 10%		
2601	Wall Jack	167	108
	Lots of 4 deduct additional 10%		

PORTER CABLE

444	New Profile Sander	157	94
9444	New Profile Sander Kit	205	119
7499	Ultimate Cut-out tool	113	69
690	1-1/2 HP Router 8 amp	260	142
691	1-1/2 HP Router D-handle	285	158
693	1-1/2 HP Plunge Router Base	320	178
6931	Plunge Router Base	125	79
695	1-1/2 HP Router/Shaper	400	229
696	Heavy Duty Shaper Table	230	135
351	3" x 21" Belt Sander w/o bag	280	159
352	3" x 21" Belt Sander with bag	290	165
352VS	3x21 Belt Sander w/bag v/spd	305	169
360	3" x 24" Belt Sander with bag	365	198
361	3" x 24" Belt Sander w/o bag	345	194
362	4" x 24" Belt Sander with bag	380	205
97751	1/2" v/spd Hammer Drill w/cse	270	158
9118	Porta Plane Kit 7 amp	390	225
505	1/2 sheet Pad Sander	230	128
7549	Top handle Jig Saw 4.8 amp	270	134
330	Speed Block Sander 1/4 sheet	110	62
556	Biscuit joiner w/5556 tilt fence	Sale	139
345	6" Saw Boss 9 amp	190	109
9345	345 comp. w/cse & carb blde	220	128
9647	TIGER CUB Recip. Saw	210	124
9637	Full var/spd Recip Saw 8 amp	270	148
7519	3-1/4 HP Router 2 Handle	445	244
7518	3-1/4 HP 5 speed Router	510	275
7538	3-1/4 HP Plunge Router	445	242
7539	3-1/4HP v/spd Plunge Router	510	269
7399	5.6 amp Drywall Cutout Unit	140	84
7310	5.6 amp Laminate Trimmer	165	98
97310	Laminate Trimmer Kit comp	360	198
7335	5" Rndm Orbit Sndr w/ case	245	135
97355	7335 w/ case & dust pick-up	274	138
7336	6" Rndm Orbit Sander w/ case	250	139
97366	7336 w/ case & dust pick-up	284	144
73333	Dust Collection system	31	24.50
9853	12V 3/8" Drill Kit	280	154
9855	12V 1/2" 2 spd,v/sp Drill Kit	335	178
8500	12V battery for above drills	Sale	45
332	Palm Grip Rndm Orbit Sander	120	74
333	above Sander with dust bag	135	79
334	333 Sander with PSA pad	135	79
340	1/4 Sheet Orb Sndr w/dust p/u	89	55
550	Pocket cutter with case	330	185
7700	10" "Lazerloc" Mitre Saw	634	345
310	Production Laminate Trimmer	250	145
347	7-1/4" "Framers" Circ Saw	225	129
347K	347 Saw w/ plastic case	250	134
743	347 Saw - left hand version	225	129
743K	743 Saw w/ plastic case	250	134
9743	743 Saw with case	255	139
447	347 Saw with brake	225	134
843	447 Saw-left hand version	245	139
7800	Drywall Sander	585	329
7810	Wet/Dry Vac for above sander	455	259
9737	New Tiger Recipro Saw	290	165

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Circle No. 92

FINISHING TOUCHES

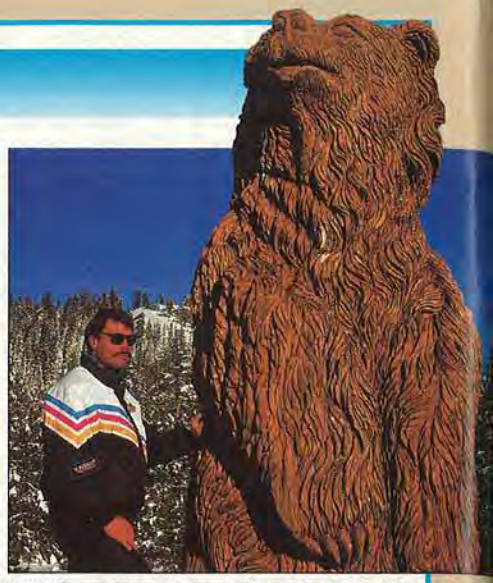
CARVER'S WAIT FOR PET PROJECT ENDS

Most woodworkers have a stockpile of wood awaiting just the right use. None can compare, though, to what California chainsaw carver Myles Tucker kept squirreled away for 10 years.

In 1984 Myles discovered a huge sugar-pine log at the bottom of a ravine in the Sierra Nevada Mountains near his home. It seems that the loggers who cut the 32'-long, 5'-diameter log from the mountainside some 25 years before couldn't figure out how to get it out. But Myles and a logger friend with winches and steel towers for running cable did.

Myles, 55, whose work has been recognized by the Smithsonian Institution, stored the log at his home until 1994. That's when Bear Valley, an all-season family resort situated between Lake Tahoe and Yosemite National Park, commissioned him to carve a pair of giant bruins to flank the main entrance.

From the salvaged log, Myles created two brown bears, each 16' tall and weighing about 13,000 pounds. Known for his attention to detail, Myles chainsawed and chiseled plenty of realism into them, as shown *right*.



"While a bear has hair all over its body, it comes in different lengths and coarseness," says Myles Tucker, standing by one of the bears he crafted with chainsaws and chisels.

How fast trees grow in the South

The Southern Pine Council and the U. S. Forest Service calculate that southern forests grow enough every 24 hours to produce the equivalent in softwood lumber for 6,000 new homes. They base their figures on the assumption that an average home of 2,000 square feet requires 14,000 board feet.

More than 24 billion trees grow on 80 million acres of timberland in the 12 southern states, reports the council. Most of these trees mature in 35 years or less, and provide material for both lumber and paper.

Create a clock, and win a trip to Germany!

Klockit, a Wisconsin-based supplier of clock movements, parts, and kits, celebrates its 25th anniversary by offering a trip for two to Germany as grand prize in its Create-A-Clock contest. First- through third-place winners in each of six categories win $50 to $100 gift certificates.

According to a spokesperson for Klockit, entries will be judged in the following clock categories: wall, mantel, floor, original, craft, and humorous. Only category winners will be eligible for the grand-prize trip.

To participate, send a color photograph of your entry by March 15, 1996 to Klockit, P.O. Box 636, Lake Geneva, WI 53147. Include your name, address, telephone number, and the category you are entering on the back of the photo. For more contest information, call 800/556-2548.

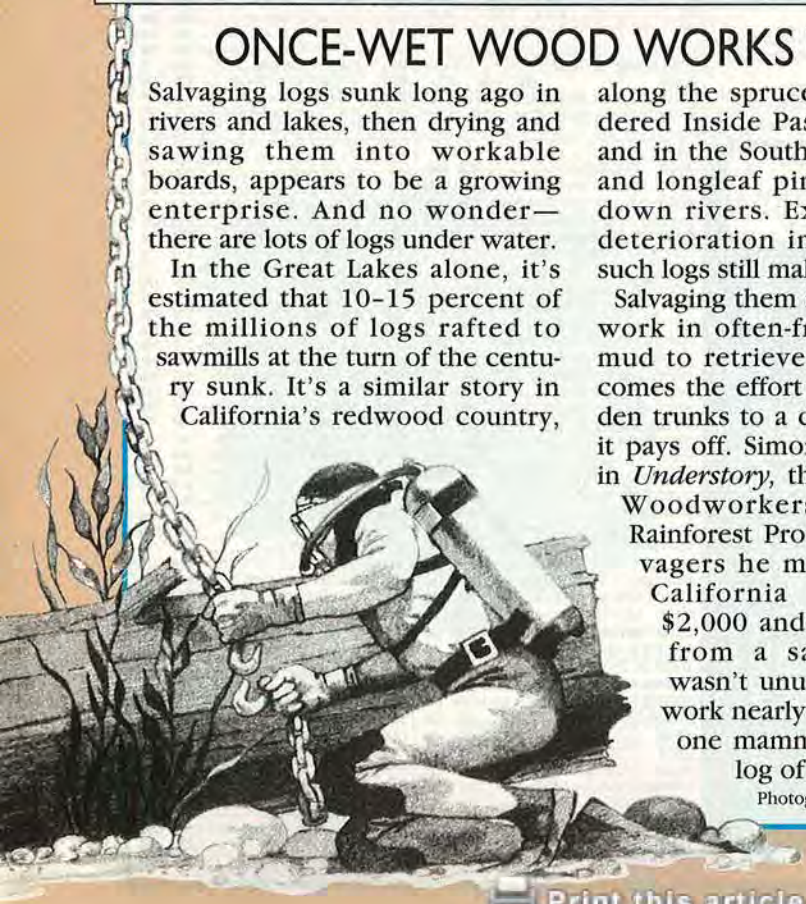
An original, corner-hugging clock by Dallas' Frank Eastman was a category winner in Klockit's 1995 contest.

ONCE-WET WOOD WORKS WELL

Salvaging logs sunk long ago in rivers and lakes, then drying and sawing them into workable boards, appears to be a growing enterprise. And no wonder—there are lots of logs under water.

In the Great Lakes alone, it's estimated that 10–15 percent of the millions of logs rafted to sawmills at the turn of the century sunk. It's a similar story in California's redwood country, along the spruce and cedar-bordered Inside Passage to Alaska, and in the South, where cypress and longleaf pine were floated down rivers. Except for some deterioration in the sapwood, such logs still make good lumber.

Salvaging them isn't easy. Divers work in often-frigid water and mud to retrieve the logs. Then comes the effort to haul the sodden trunks to a drying place. Yet it pays off. Simon Watts, writing in *Understory,* the journal of the Woodworkers Alliance for Rainforest Protection, says salvagers he met in Northern California got between $2,000 and $6,000 per log from a sawmill. But it wasn't unusual for them to work nearly a month to raise one mammoth, old-growth log of redwood.



Photograph: Courtesy Carter/Waxman Illustrations: Jim Stevenson

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WITH A FREE MOBILE BASE, IT'S EASY TO ROLL DELTA QUALITY INTO YOUR SHOP.

FREE Get a free mobile base when you buy this 14" Band Saw with open stand. Cuts stock up to 6¼" thick and 14" wide. Contour, straight cut, resaw and roll.

FREE Buy the Contractor Saw with a 30" Unifence and we'll put it on wheels for free. With a free mobile base for both the saw and the Unifence extension, you'll be rolling first class.

FREE 14" Band Saw with enclosed stand comes with a free mobile base, plus a free 18" fence. The ultimate deal on wheels.

FREE Free mobile bases plus free knife-setting jigs make our DJ-20 8" and DJ-15 6" Precision Jointers as manageable as they are accurate.

SELECT TOOLS
DEALS ON WHEELS
LIMITED TIME

We all love those Delta machines. But sooner or later, something's got to give. There's only so much shop space before we hit our limit.

Now here's an idea that just might move you. For a short time only, we're making it easier than ever to roll one of these beauties into your shop and park it anywhere you want.

Just buy any one of the five machines pictured here, and we'll let you slip a hefty mobile base underneath it for free. A genuine Delta Accessory that makes these valuable machines even better. So you'll be able to rearrange your space on a daily basis, if you want. Or move one machine to work in closer proximity to a companion piece. Effortlessly. (Who knows, you might even have room for *two* new machines.)

We're rolling out our *Deals On Wheels* promotion for a limited time only. And *only* at participating Delta dealers. And if you look closer you'll notice that several of these tools even have an extra goody to make an already great value even greater.

If you're ready to roll Delta Quality into your shop, call for the name of your nearest participating dealer. Delta International Machinery Corp., 800-438-2486. In Canada, 519-836-2840.

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Ram Sport is available in regular and Club Cab models. For still more information, give us a shout at 1-800-4-A-DODGE.

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Always wear your seat belt for a fully effective airbag. *We calculated resale using avg. trade-in values for '94 full-size models vs. MSRPs, published in Jan.-July '95 *N.A.D.A. Official Used Car Guide*® monthly editions. Use of these values does not constitute NADA's endorsement.

Better Homes and Gardens®
WOOD® PATTERNS™
Full-sized for your woodworking convenience

JANUARY 1996 **ISSUE 85**

Dear Reader: As a service to you, we've included full-sized patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.

- **Corner shelf**
- **Knock-down cradle**
- **Woodworker carving**
- **Sherlock desk set**

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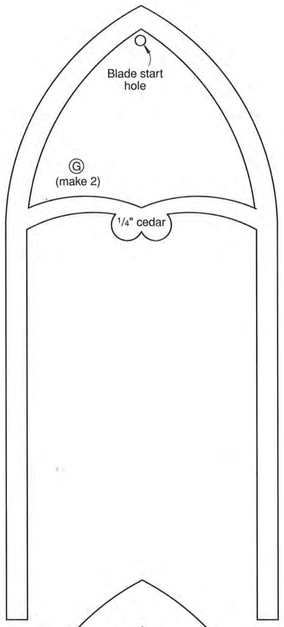

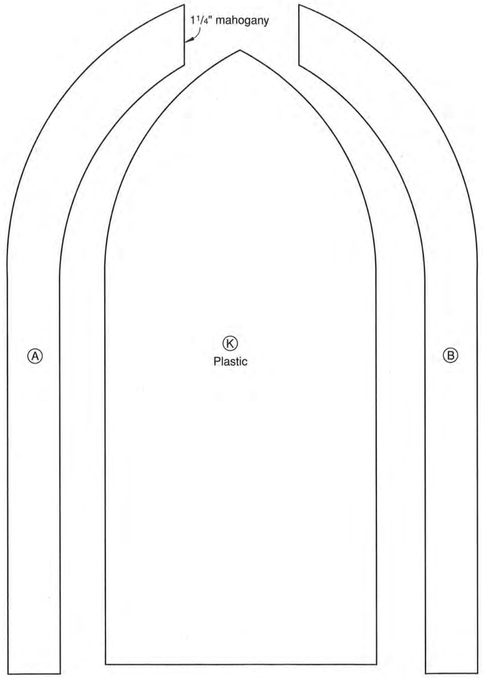

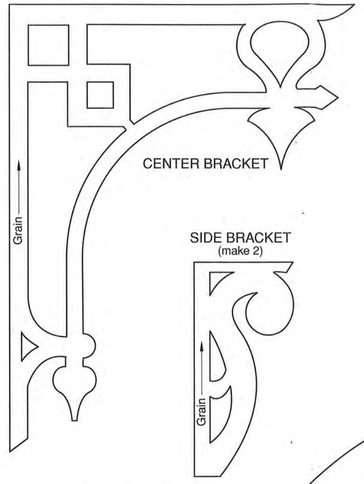

SCROLLSAWED WHAT-NOT-SHELF
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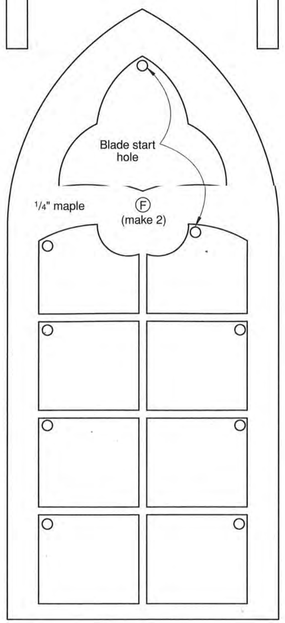
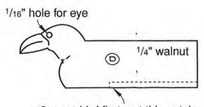
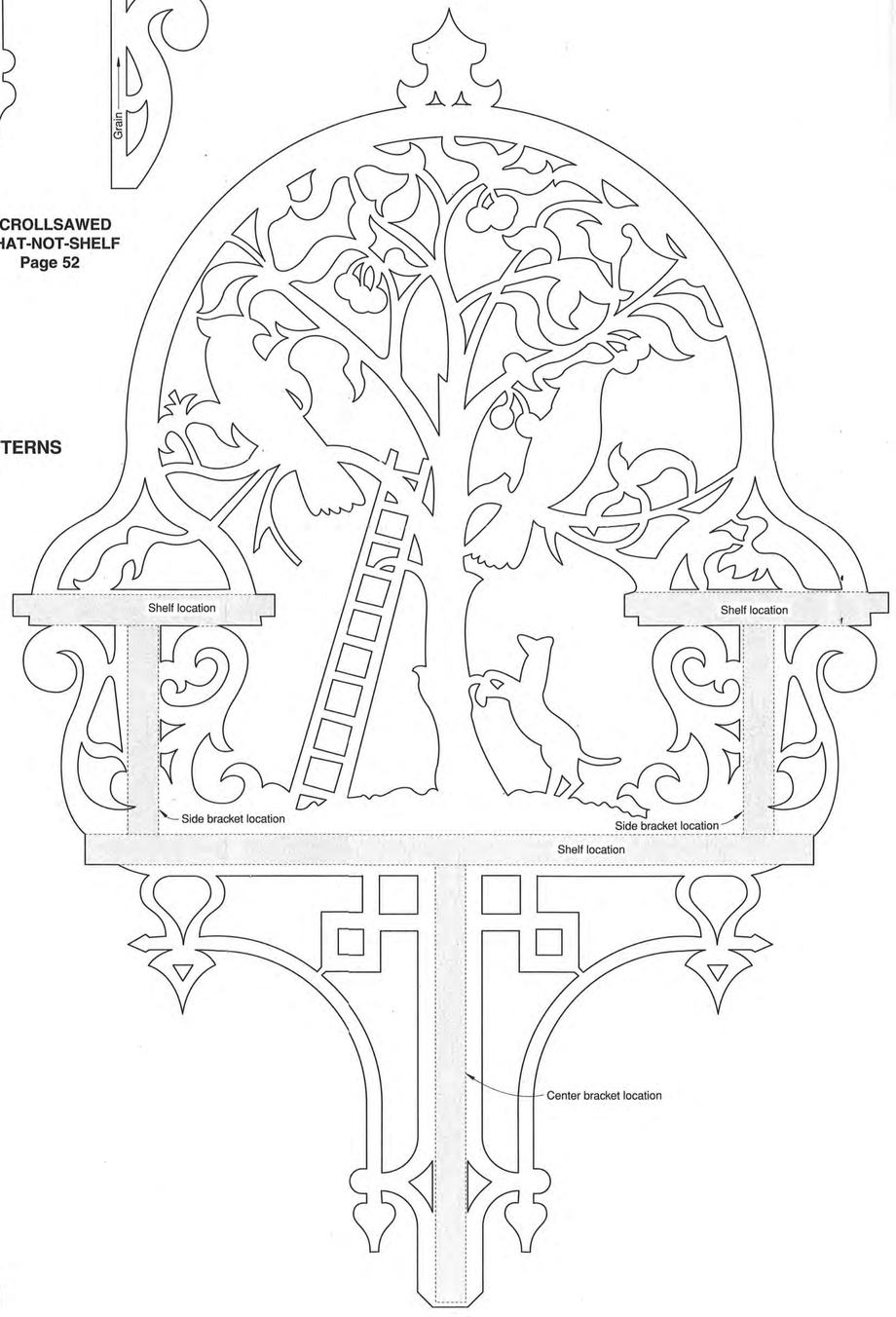
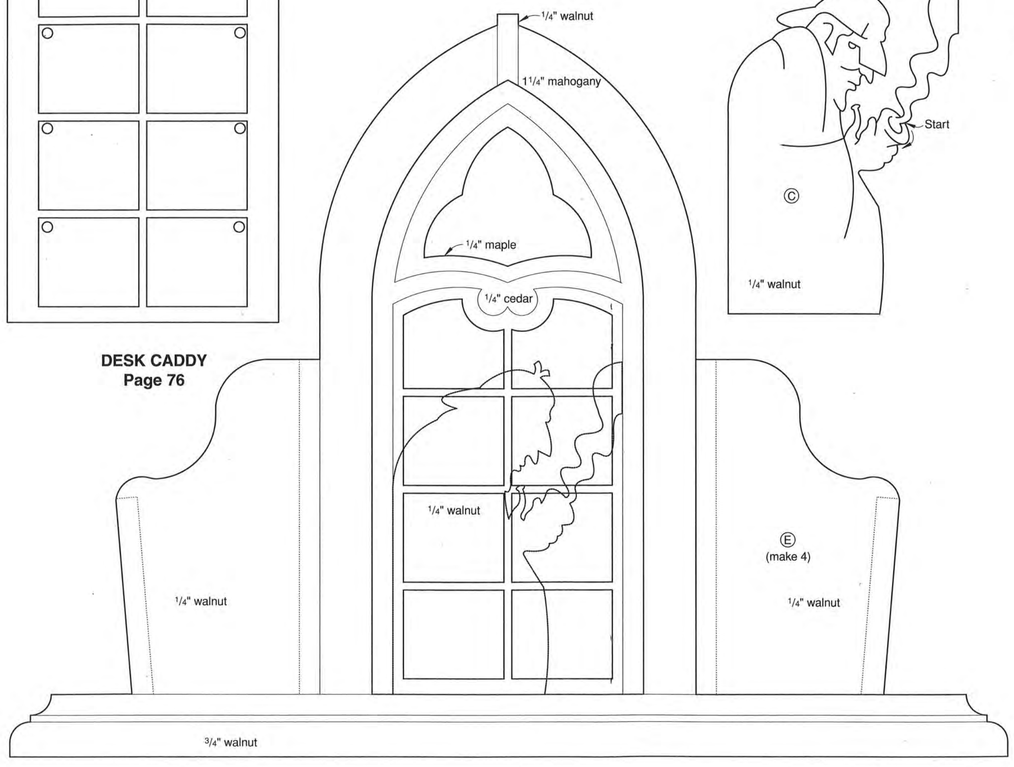
FULL-SIZED PATTERNS









DESK CADDY
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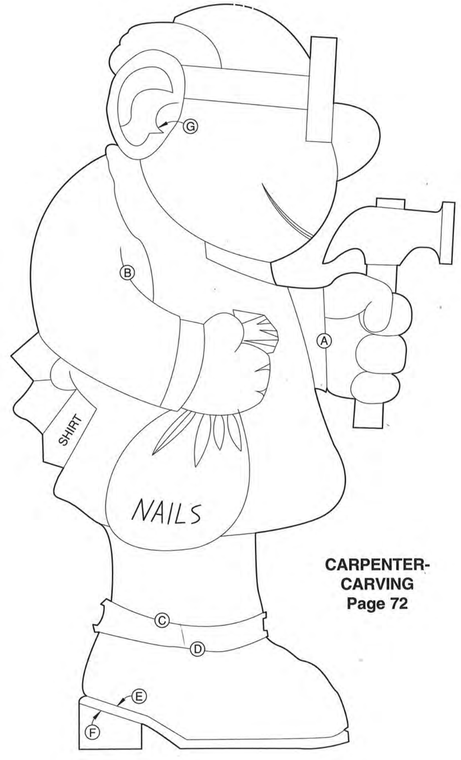

CARPENTER-CARVING
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CRADLE
FULL-SIZED PATTERNS
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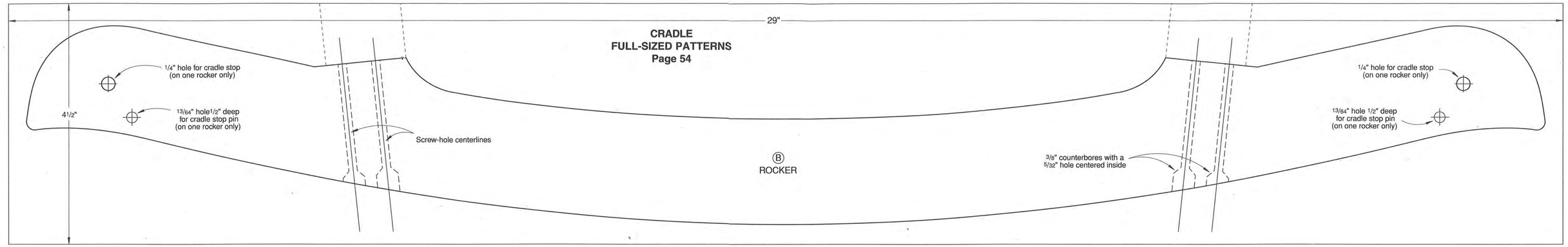
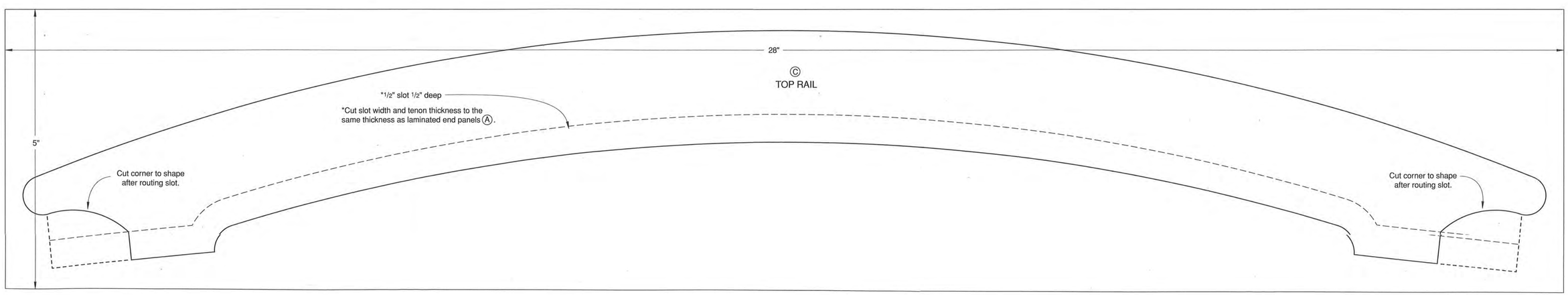
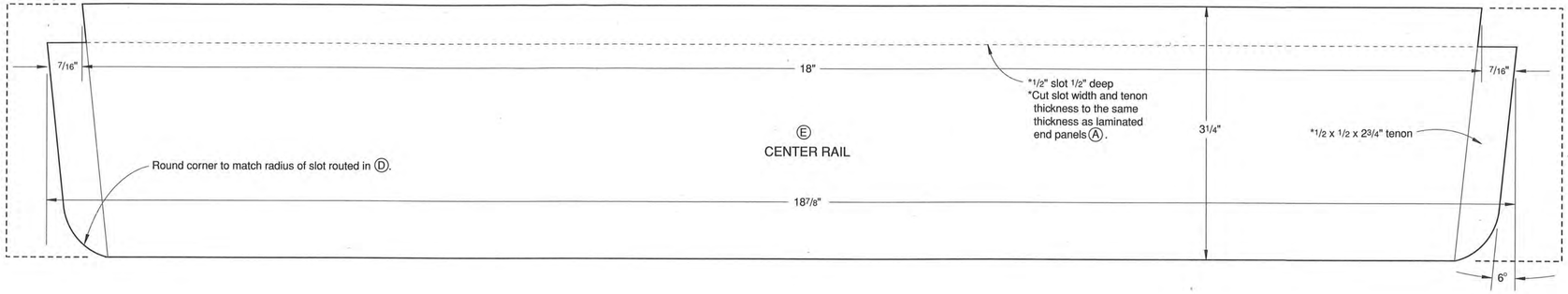
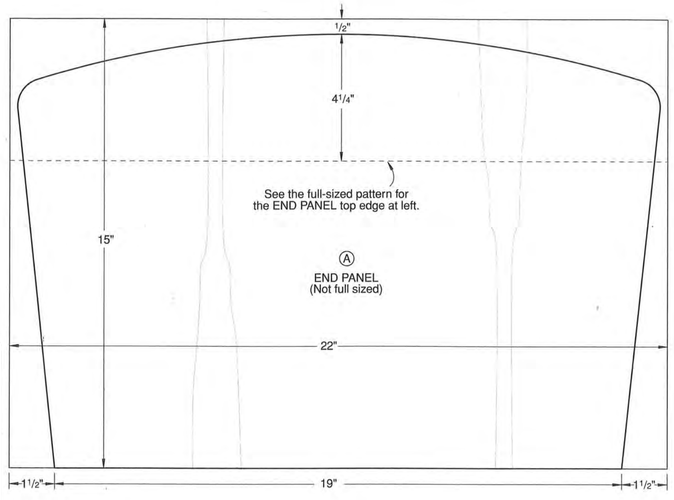
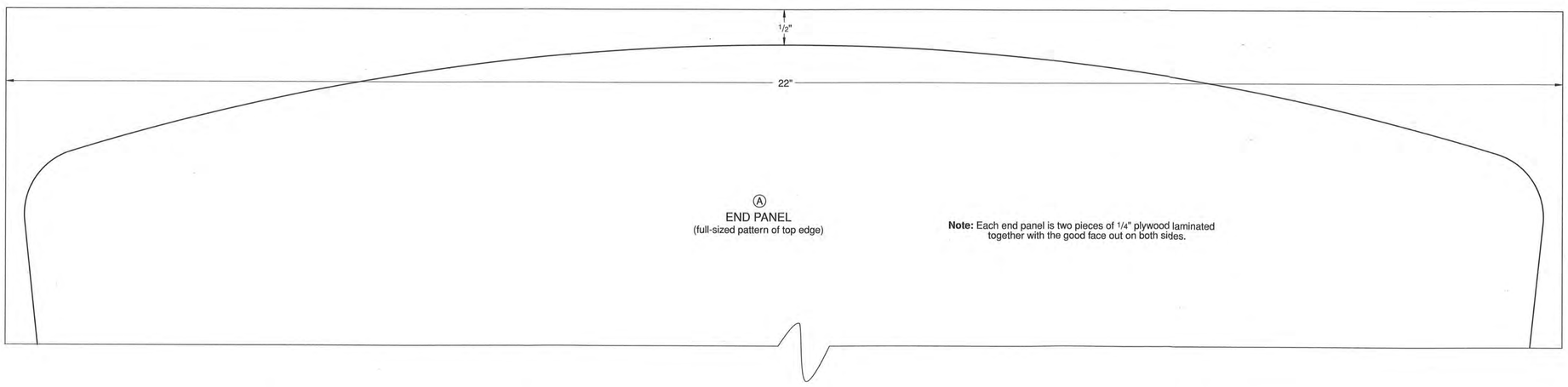

29"
41/2"
1/4" hole for cradle stop (on one rocker only)
13/64" hole1/2" deep for cradle stop pin (on one rocker only)
Screw-hole centerlines
Ⓑ
ROCKER
3/8" counterbores with a 5/32" hole centered inside
1/4" hole for cradle stop (on one rocker only)
13/64" hole 1/2" deep for cradle stop pin (on one rocker only)


28"
5"
Ⓒ
TOP RAIL
*1/2" slot 1/2" deep
*Cut slot width and tenon thickness to the same thickness as laminated end panels Ⓐ.
Cut corner to shape after routing slot.
Cut corner to shape after routing slot.







Note: Each end panel is two pieces of 1/4" plywood laminated together with the good face out on both sides.